City of Winter Park

Transportation Master Plan

August 2023

ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

The City of Winter Park Transportation Master Plan (TMP) is a strategic approach to investing in safe, efficient, and attractive travel choices for residents and visitors. The TMP is intended to guide community decisions in a balanced approach that considers all transportation users. The TMP presents a baseline overview of Winter Park's existing transportation networks for various modes of travel, measuring the safety, network connectivity, and operations of the transportation system to identify issues and directly inform the prioritization of projects based on the identified needs and opportunities.

Starting from the analysis of existing conditions, the TMP identifies lists of prioritized projects by type of investment, along with planning-level cost estimates for each project. Table 1 presents an overview of the 20-year and annual spending targets required to complete the full set of recommended projects. The capital projects within each project category (Map 1) are the physical infrastructure needed to connect and improve the transportation networks for all modes of travel.

TABLE 1: SUMMARY OF CAPITAL PROJECTS

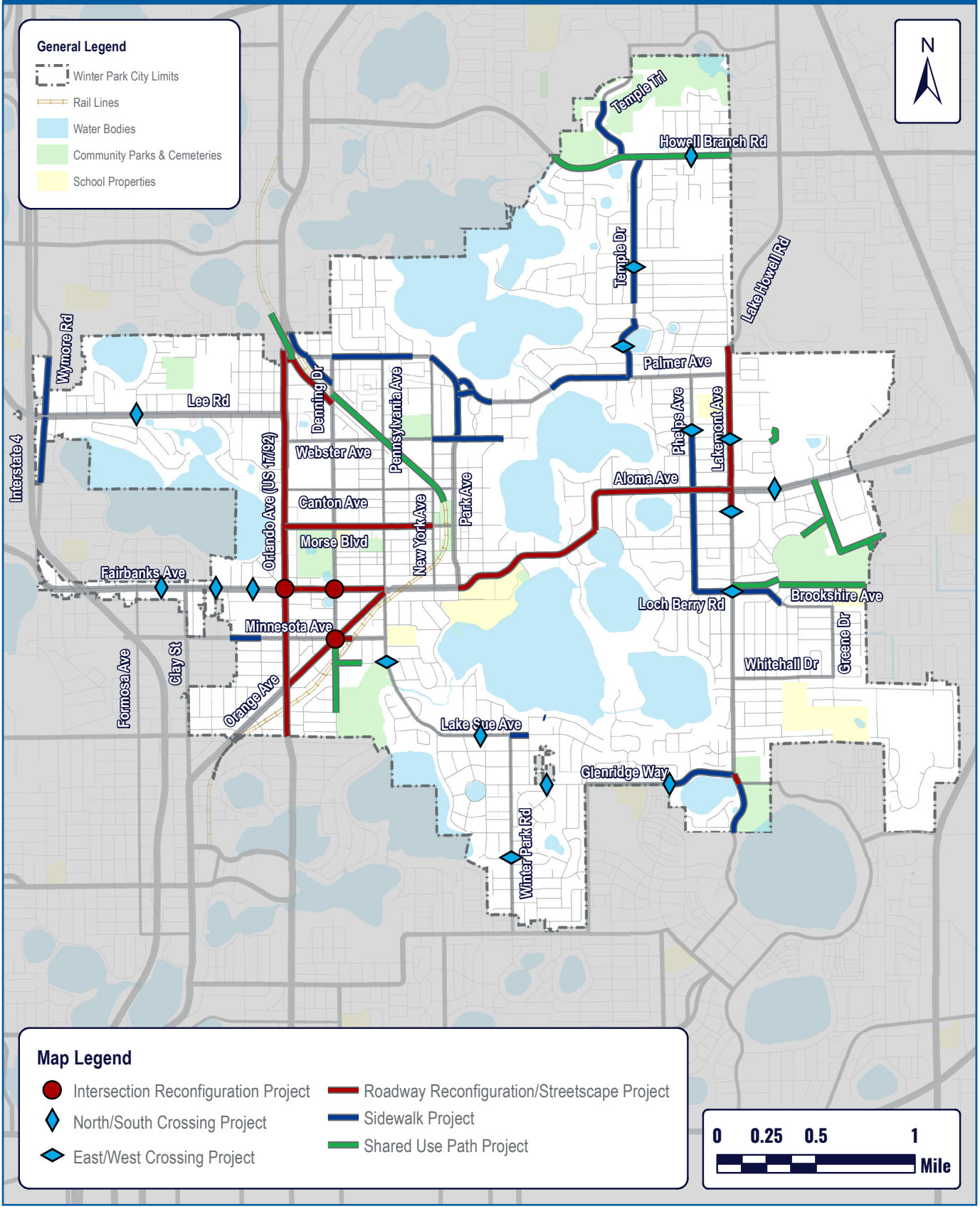
Project Category	20-Year Cost Estimate	Annual Cost Estimate
Sidewalk Projects	$14,222,000	$711,100
Shared Use Path & Greenway Projects	$23,866,000	$1,193,300
Crossing Projects	$14,415,000	$720,750
Roadway Reconfiguration & Streetscape Projects	$69,480,000	$3,474,000
Technology Projects	$19,625,000	$981,250
Capital Projects Total	**$141,608,000**	**$7,080,400**

The recommendations have in part been pulled from projects that have been long needed and studied in Winter Park. New project concepts have been developed based on review of the baseline operations in collaboration with City staff. Special attention is given to identifying a network of greenway routes (Map 2) as well as strategic technology investments. Projects have been assigned prioritization within each category to indicate the relative timeline for completion. Project prioritization within each category reflects a combination of factors including the analysis of the existing transportation networks, feedback received at presentations, a planning-level review of constructability, and potential for significant progress on developing connected networks across all parts of Winter Park.

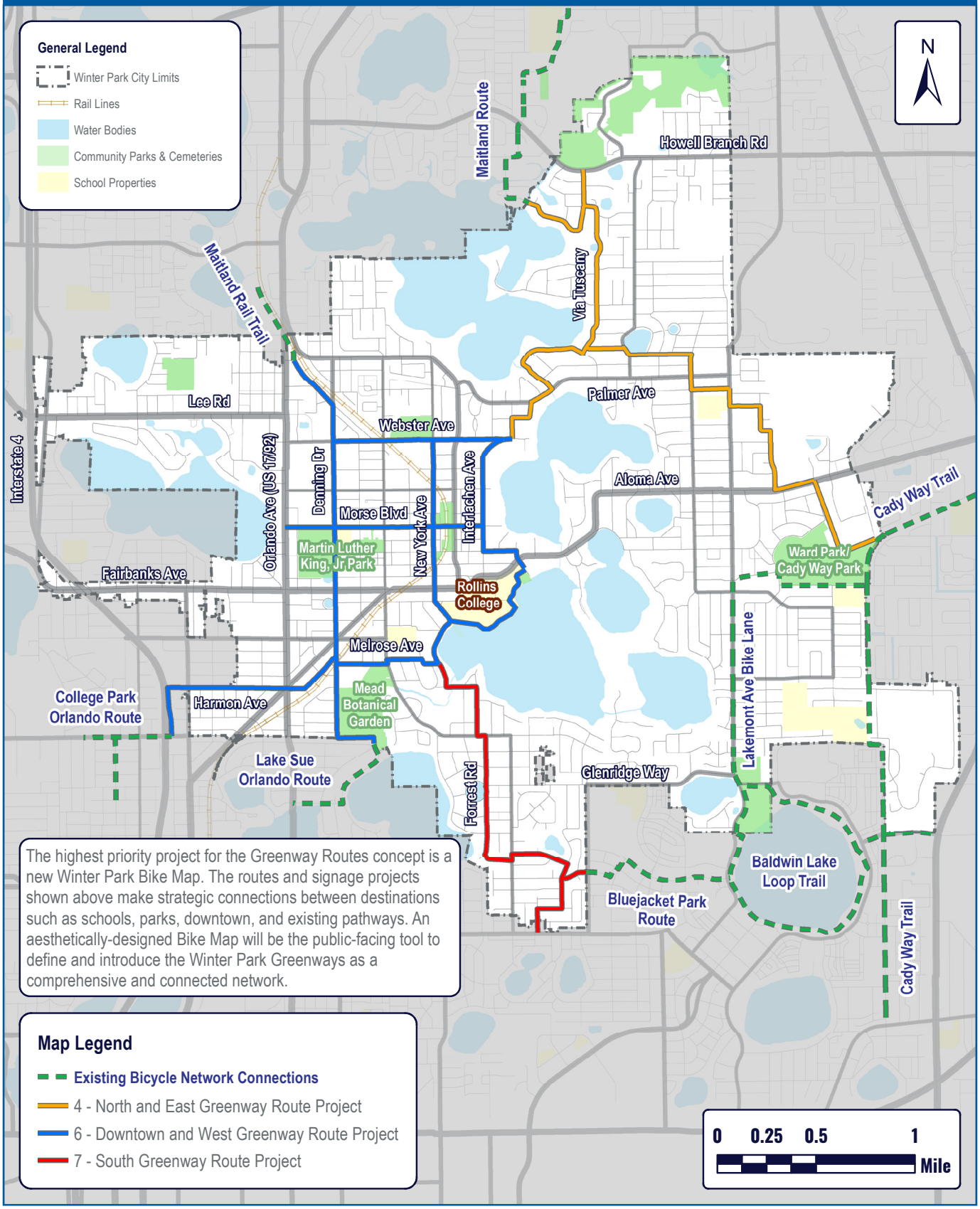
All projects have been subsequently screened for feasibility and conformance with the applicable local, state, and federal design standards and guidance. Cost estimates for each recommendation are included in Appendix B. The planning-level cost estimates include percentage-based multipliers applied to the construction costs for unknowns, design, maintenance of traffic, and construction inspection. Notably, the TMP identifies the likely elements to be included with each project but does not include detailed design alternatives for individual locations.

Finally, the TMP provides targeted guidance for the implementation of recommended projects, policies, funding strategies, and design following the latest best practices.

Map 1 - Executive Summary - All Projects



Map 2 - Executive Summary - Greenway Route Concept



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INTRODUCTION

TRANSPORTATION MASTER PLAN OVERVIEW

The City of Winter Park Transportation Master Plan, hereinafter referred to as the TMP, is an update to the 2011 Traffic and Transportation Plan. The TMP identifies policies and investment priorities to provide safe, efficient, and attractive travel choices for residents and visitors. The plan is intended to guide community decisions in a balanced approach that considers all transportation users. Reflecting the current conditions, the TMP builds upon and updates the analysis completed under the 2018 Mobility Plan study effort. During the update process, there was an opportunity to scratch completed projects off the list, re-evaluate the needs, and identify new project opportunities. The TMP was developed in close coordination with City staff, Transportation Advisory Board, and City Commission. The project team received valuable feedback from the City Commission and Transportation Advisory Board, who advised consideration of the following factors to guide the development of new project recommendations and priorities:

- Address both future demographics and large numbers of elderly people on foot.
- Consider evolving technologies for traffic signals and prepare for the future needs of autonomous, connected, and electric vehicles.
- Identify tools to address traffic speed and pass-through traffic.
- Provide guidance toward latest best practices and design standards.
- Promote access to downtown and SunRail.

The TMP begins with a baseline overview of Winter Park's existing transportation networks for various modes of travel and measures the operations and safety of the networks. Starting from the analysis of existing conditions, the TMP identifies lists of prioritized projects by type of investment, along with planning-level cost estimates for each project. Special attention was given to identifying a network of greenway routes as well as strategic technology investments. Notably, the TMP identifies the likely elements to be included with each project but does not include detailed design alternatives for individual locations. Finally, the TMP provides targeted guidance for the implementation of recommended projects, policies, funding strategies, and design following the latest best practices.

COMPREHENSIVE PLAN – TRANSPORTATION ELEMENT

The Comprehensive Plan is Winter Park's guiding document addressing community growth and the policies that dictate public infrastructure, including transportation. The existing transportation element of the Comprehensive Plan (See Appendix A) references the need for multimodal transportation options and identifies the following transportation goals:

- Goal 2-1: Balanced Transportation System ► Objective 2-1.1: Safe & Balanced Multimodal System.
- Goal 2-2: Safe Transportation Network ► Objective 2-2.1: Safety for All Modes of Transportation.
- Goal 2-3: Pursuit of Technology & Innovation ► Objective 2-3.1: Innovative Transportation Infrastructure.
- Goal 2-4: Funding Opportunities ►Objective 2-4.1: Funding Partnerships.

TRANSPORTATION NETWORK BASELINE

This chapter provides an overview of the existing transportation conditions within Winter Park. Highlighting Winter Park's assets provides context for ongoing investments and establishes a baseline for identifying needs.

CITY CONTEXT

Winter Park is a desirable place to live with a high quality of life driven by the thriving downtown, high-quality neighborhoods, scenic lakes, and proximity to the many amenities of the broader Orlando Metro area. Tree-lined brick streets, lively storefronts, and engaging architecture provide a walker's paradise and invite exploration. Maintaining and expanding that walkability is a key concern for Winter Park.

An overview of Winter Park's land uses and key destinations such as schools are shown in Map 3. Areas where greater than 20% of the population are aged 65 and over are shown in Map 4, further emphasizing the demand for streets that are walkable and comfortable for all.

Recent years have seen an investment in projects such as enhanced pedestrian crossings and the initiation of SunRail commuter service that brings people downtown without cars. Further efforts to improve mobility and safety for people outside cars include the creation of a wide pathway and enhanced crossings along Denning Drive, connecting neighborhoods to parks and other civic destinations. A recent transportation focus of the City has been working with the Florida Department of Transportation (FDOT) District 5 to address State Road (SR) 426, particularly moderating traffic speeds and increasing pedestrian access along the section between Park Avenue and Lakemont Avenue.

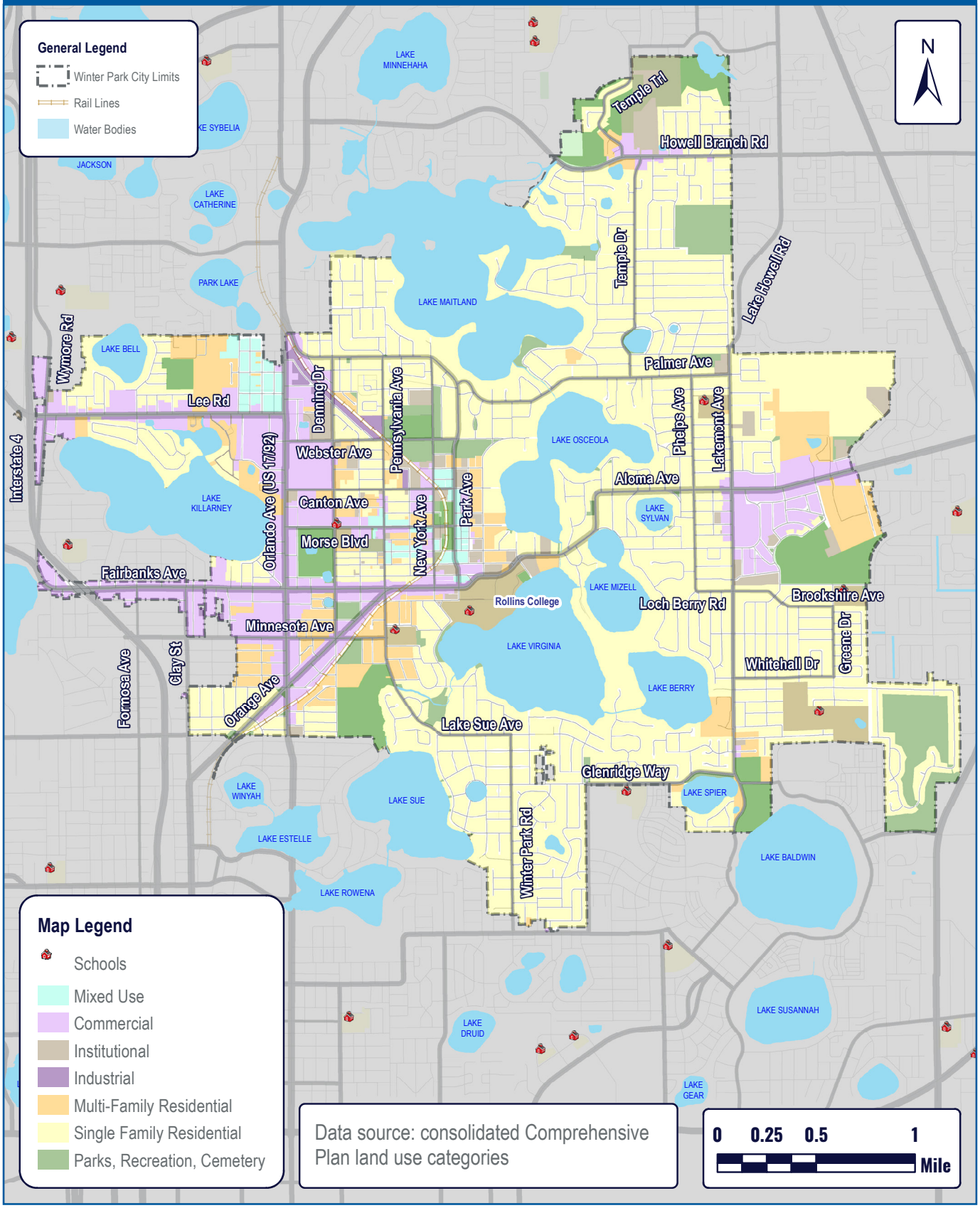
ROADWAY NETWORK

Winter Park's roadway network plays a significant role in the daily movement of people and goods throughout the city. It is useful to categorize the streets by arterial-collector-local functional classifications based on the roles they serve and how they connect the network. Functional classification carries with it expectations about roadway design, including its speed, capacity, and relationship to existing and future land use development. The functional classification of roadways in Winter Park is shown in Map 5.

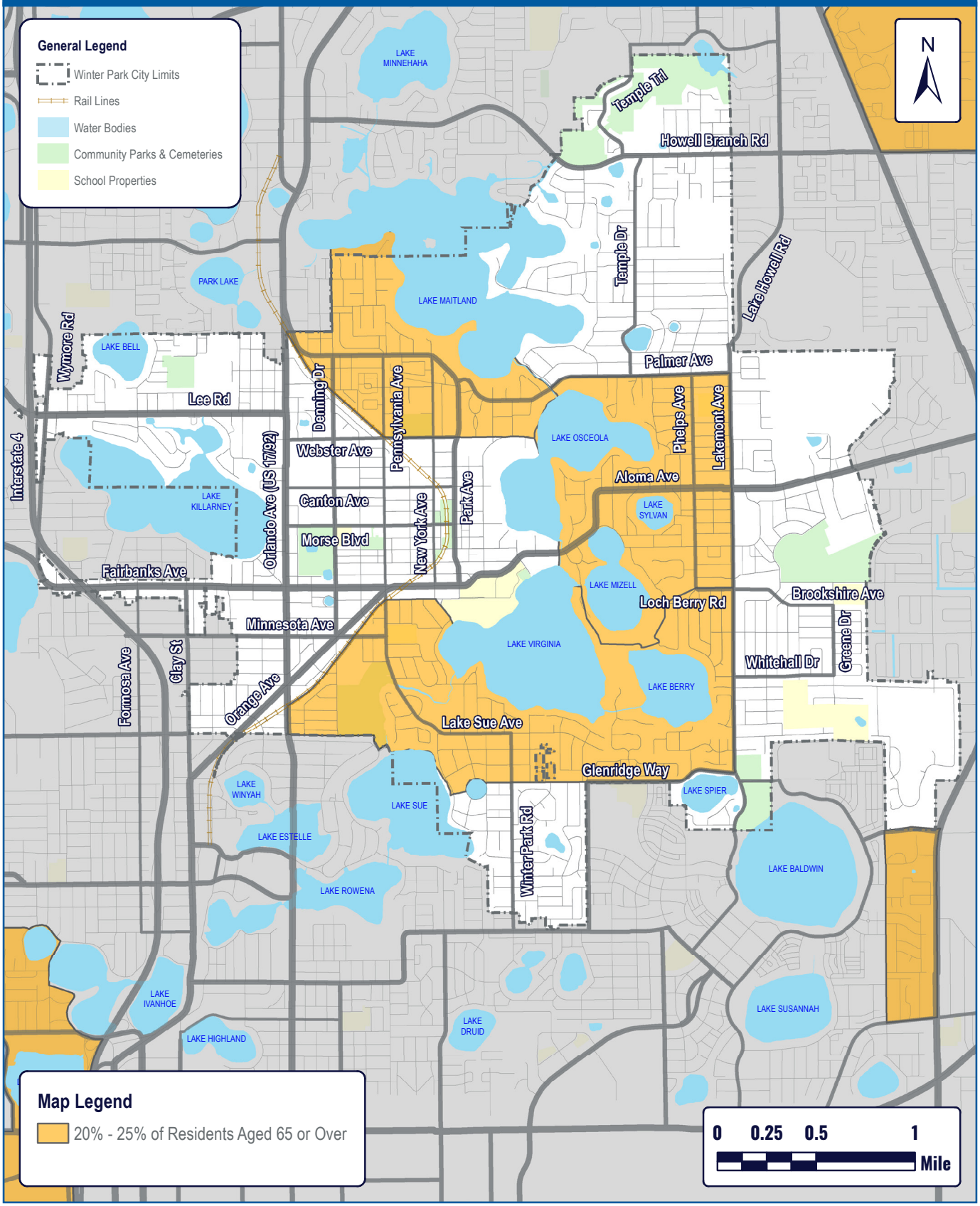
Winter Park's roadway network features two primary, multi-lane roadway corridors that traverse the city: US Highway 17/92 running north-south to the west of downtown and SR 426 (Fairbanks Avenue/ Aloma Avenue) running east-west through the city. US 17/92 is a commercial corridor whereas SR 426 traverses several land use contexts including commercial strips, downtown, and single family residential. Additional key roadway links include Lee Road connecting I-4 to US 17/92 and Howell Branch Road running east-west across the northern end of Winter Park. Orange Avenue connects Orlando to downtown Winter Park with a traditional main street of storefronts. Further emphasizing their importance for regional travel, the above roadways form the officially designated freight routes and are managed by the Florida Department of Transportation (FDOT) or Orange County, except for the portion of Orange Avenue east of US 17/92 which is not a freight route and is owned and maintained by the City of Winter Park. The ownership of roadways and existing designated freight routes are shown in Map 6.

Notably, a north-south chain of lakes divides Winter Park into halves, with downtown and the commercial areas along US 17/92 to the west, and predominantly single-family residential neighborhoods to the east. Due to the lakes, there are limited routes that connect downtown with the eastern half of the city. The major connection is the primary arterial of SR 426 as noted above. Palmer Avenue to the north and Pennsylvania Avenue/Glenridge Avenue to the south are the other two route options. Lakemont Avenue is the north-south connection between these routes along the east side of Winter Park. Where not broken up by lakes, the rest of Winter Park's roadways form a well-connected network of two-lane local streets.

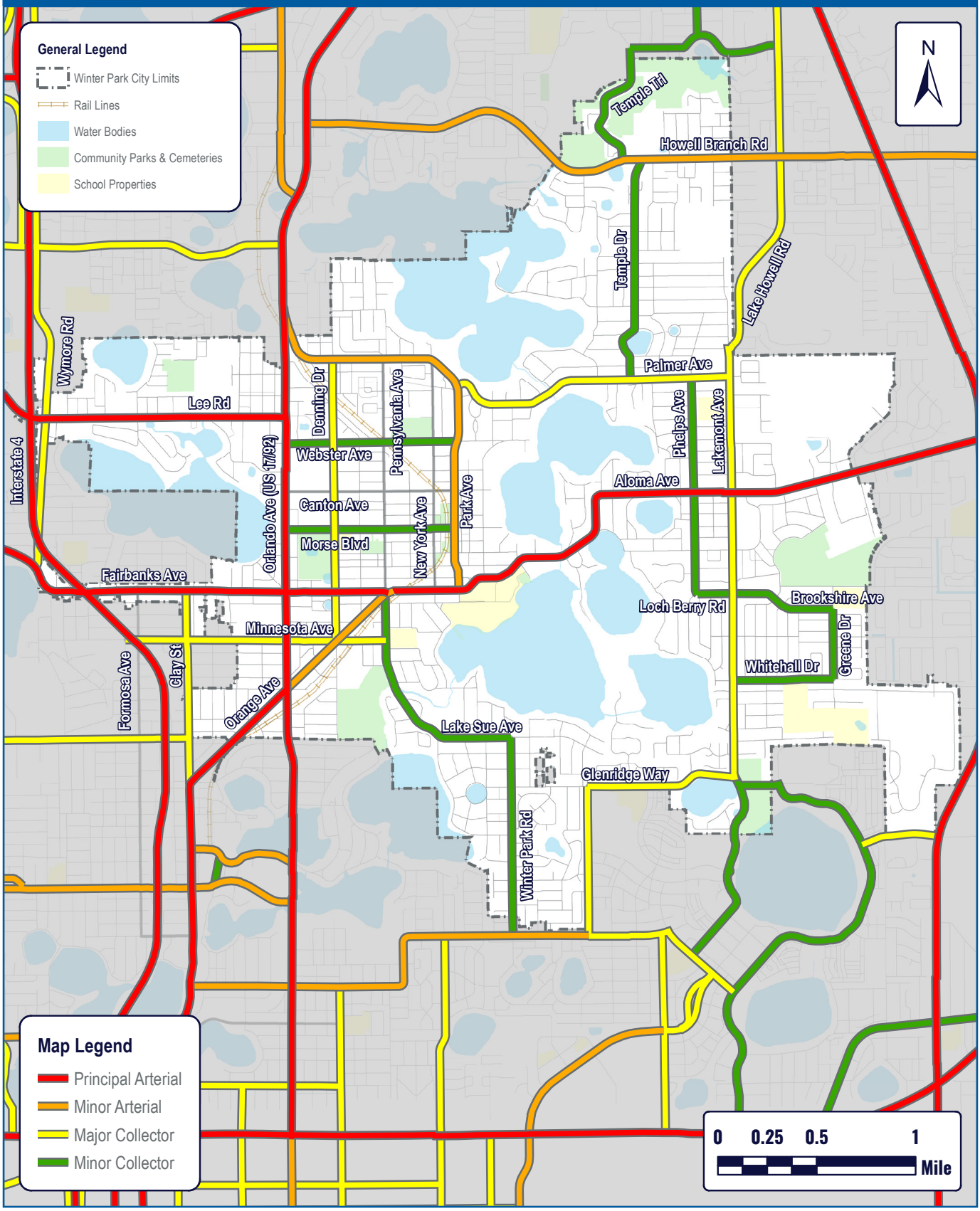
Map 3 – Land Use Context



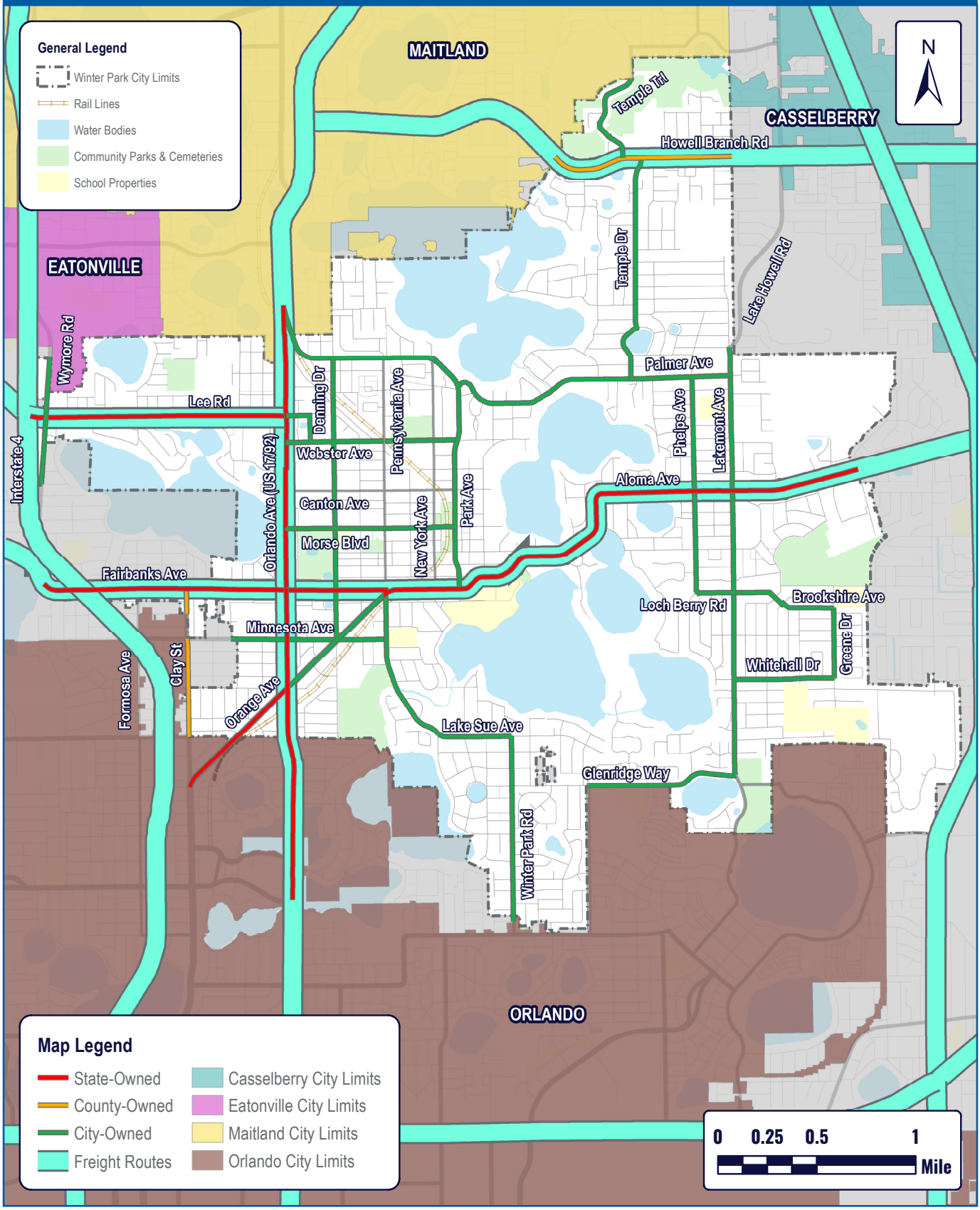
Map 4 – Areas with Concentration of Population Aged 65 and Over



Map 5 – Roadway Functional Classifications



Map 6 – Roadway Ownership & Existing Freight Routes



WALKING & BICYCLING NETWORK

Winter Park's pedestrian network consists largely of sidewalks. As shown in the Sidewalk Inventory (Map 7), there are sidewalks on both sides of most City streets. Some streets have physical constraints with sidewalks on only one side. The streets without any sidewalks tend to be low speed and low volume residential streets.

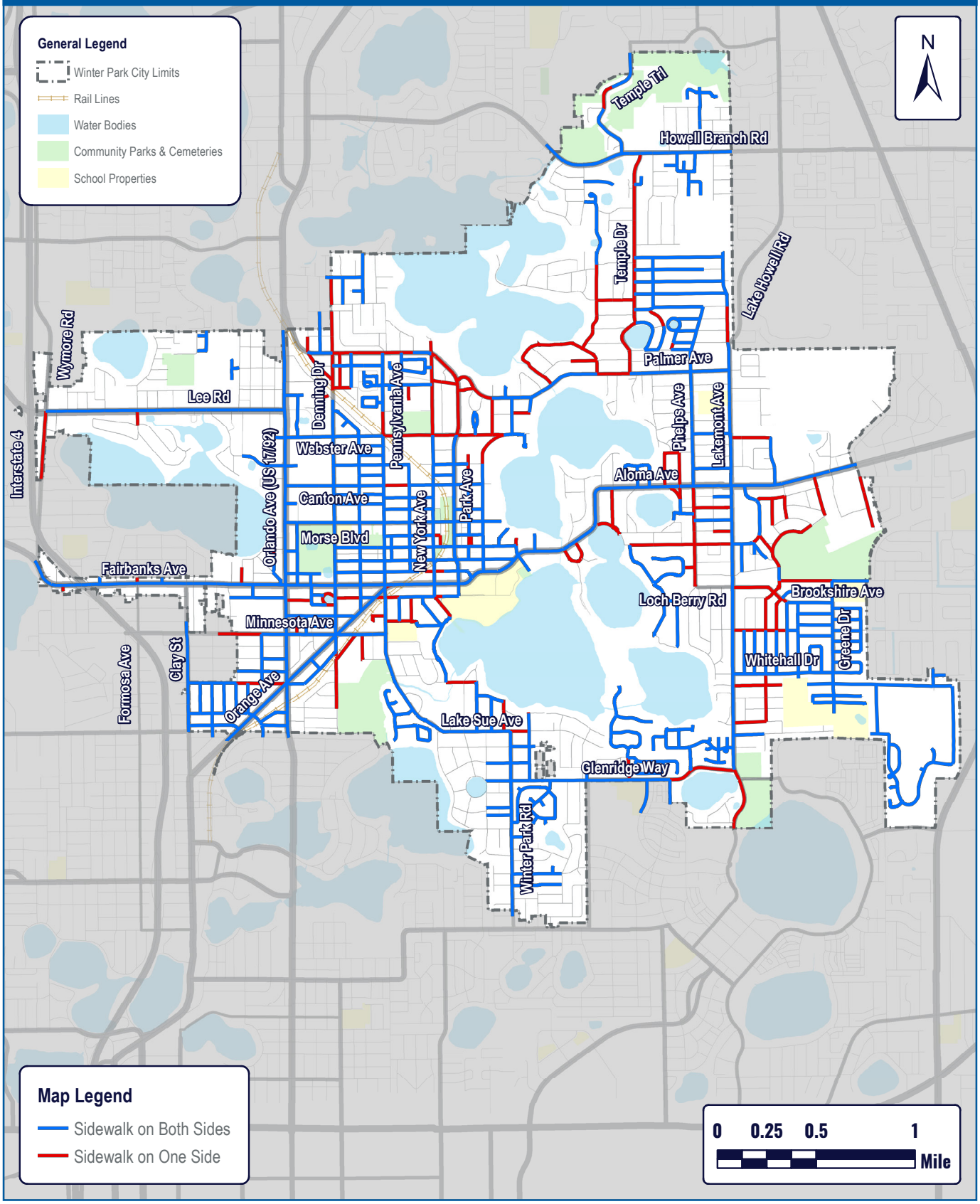
The primary shared use path in Winter Park follows Denning Drive and represents a significant investment and priority of the City (Figure 1). The other connected system of pathways is the Cady Way Trail along the eastern edge of Winter Park and Lake Baldwin to the southeast. Several segments of roadways have designated bike lanes, Shared Lane Markings (aka "sharrows"), or signage indicating bicycle routes; however, there is no cohesive network of bicycle facilities or routes that connect between primary destinations such as downtown, major parks, or schools. The existing bicycle routes, shared use paths, and enhanced crossings are shown in Map 8.

Figure 1 - Denning Drive shared use path and enhanced crossing.

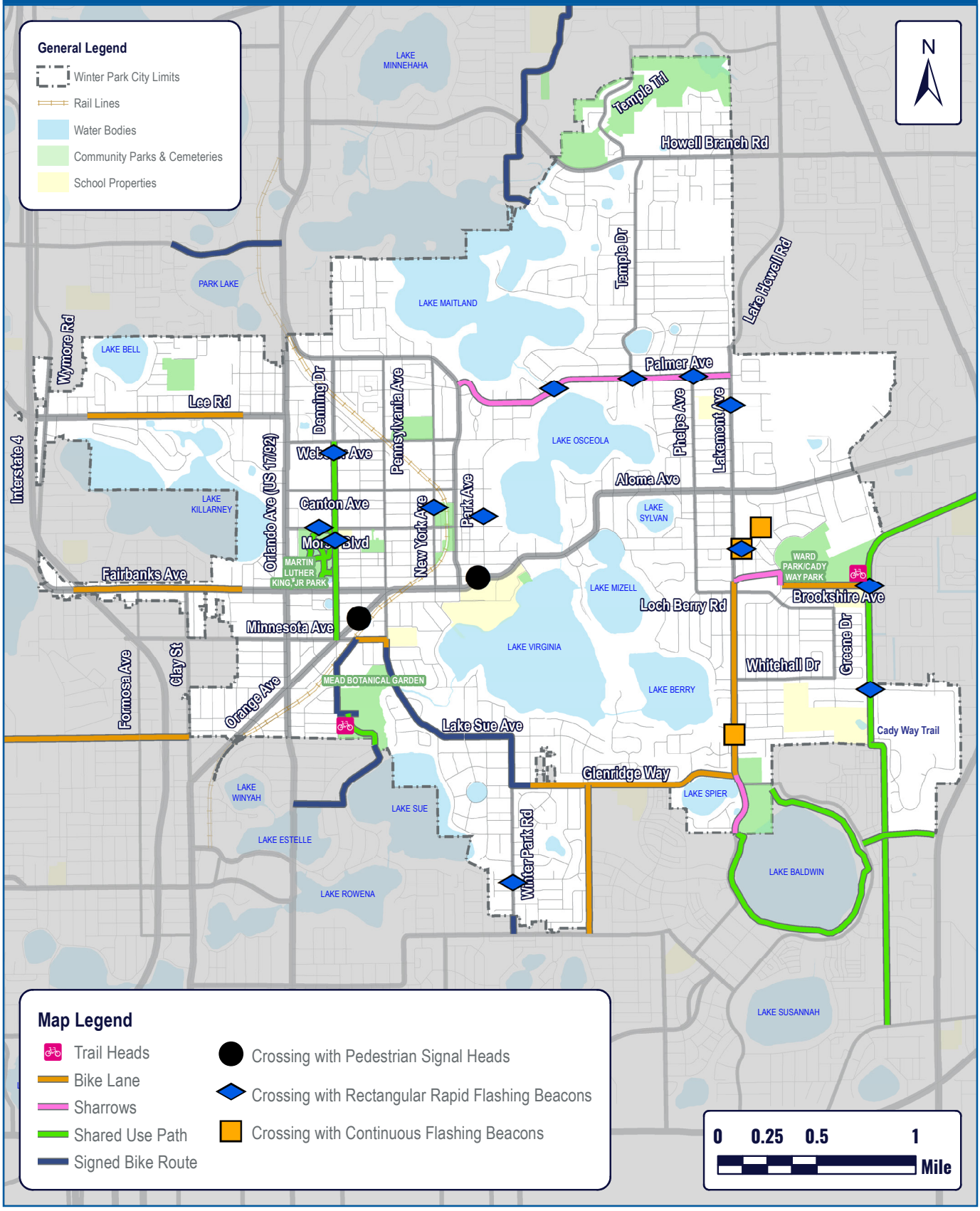
Throughout Winter Park, there are islands of ideal walking and bicycling conditions, but there are also barriers such as large roadways that prevent these comfortable areas from connecting to one another. Winter Park has made investments into enhanced crossing infrastructure in a number of locations to make those crossings safer and more comfortable. The enhancements include dedicated signals for pedestrians, median refuge islands, rectangular rapid flashing beacons (RRFB), continuously flashing warning signs at crossings, and low signs (aka "paddles") mounted directly on the roadway surface between travel lanes at crossings. Figure 2 shows the dedicated pedestrian signal across Orange Avenue.

Figure 2 - Signalized pedestrian crossing along Orange Avenue.

Map 7 – Sidewalk Inventory



Map 8 – Bicycle Route, Shared Use Path & Crossing Inventory



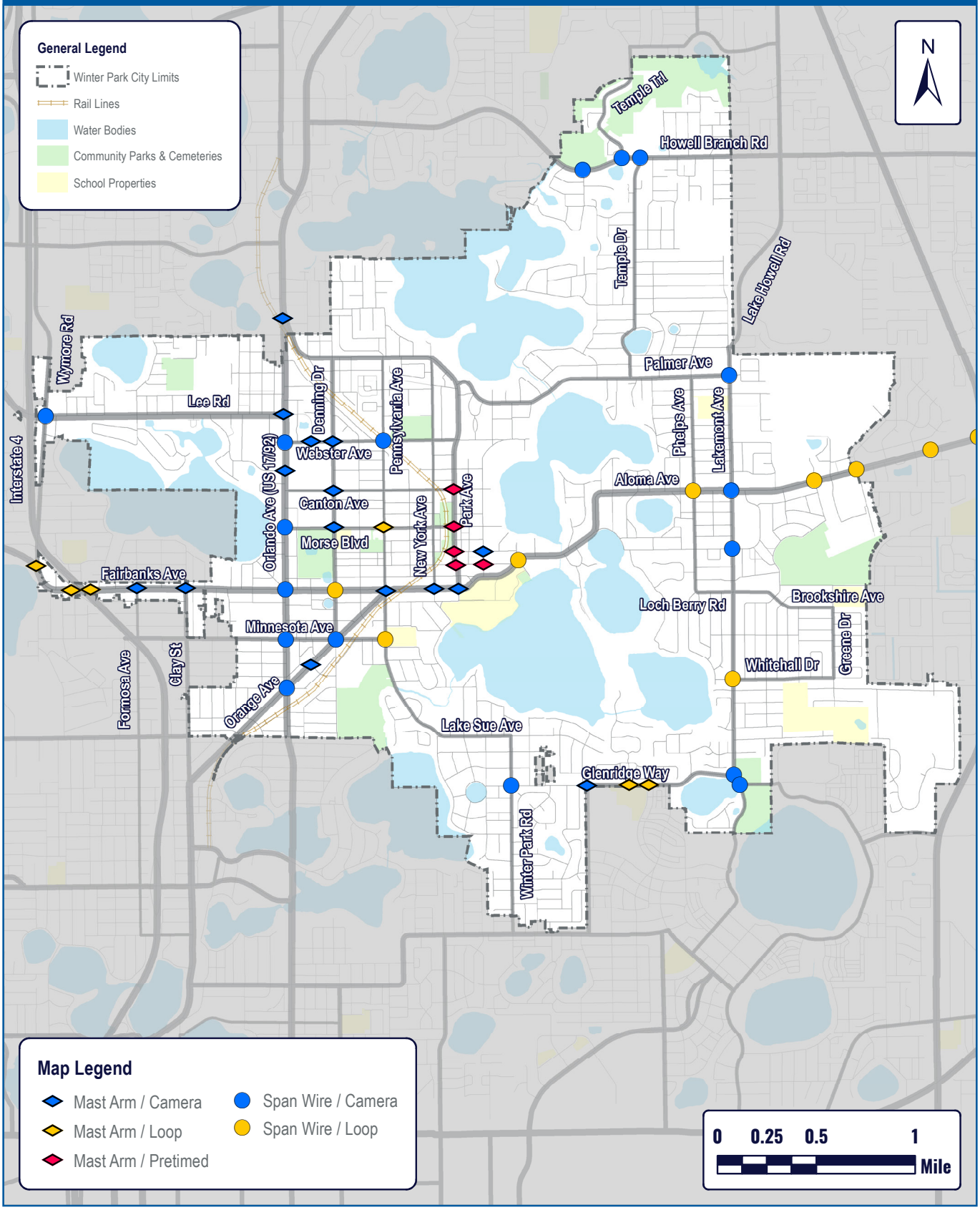
TRAFFIC SIGNALS & TECHNOLOGY

There are 47 traffic signals operational within Winter Park (Map 9). The City owns 27 of the signals and the State of Florida owns 20 of the signals, but they are all maintained by the City of Winter Park. The signals operate pre-timed along Park Avenue, with the rest of the signals having the capability for actuation by video or loop detection. The existing historic traffic signals along Park Avenue are shown in Figure 3.

Figure 3 - Legacy traffic signal equipment along Park Avenue

Fiber optic cables provide a way to collect data from traffic devices and to communicate between devices. The benefits of using fiber transmission include bigger bandwidth, faster speeds at longer distances, higher resistance, and increased security. The cables typically run through conduits installed underground. Junction boxes are installed at locations where cables are spliced. Information published by FDOT and shown in Figure 4 indicates that there are existing traffic data fiber cable installations along I-4, Lee Road, US 17/92 north of Lee Road, and along the railroad line.

Map 9 – Traffic Signal Inventory



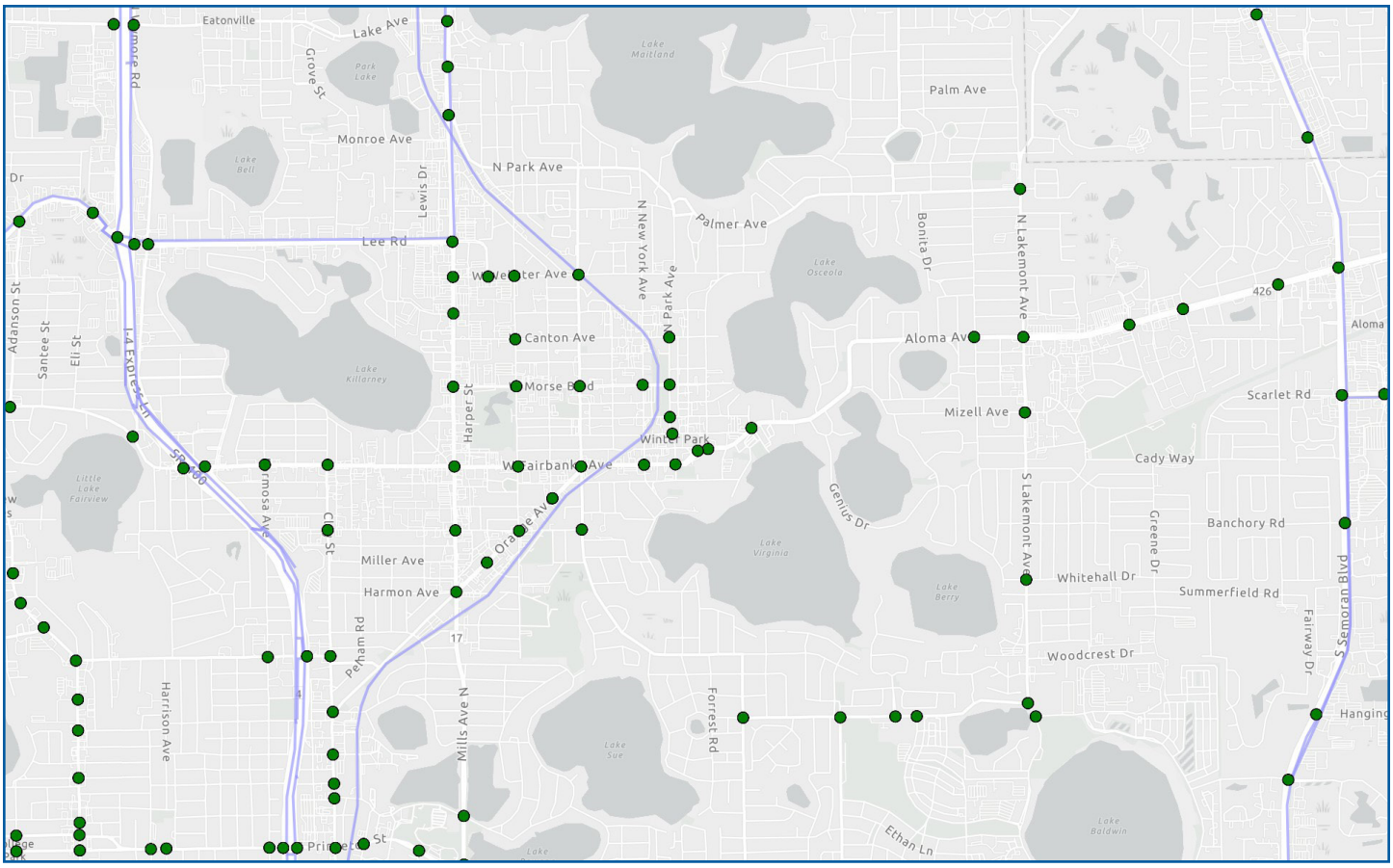


Figure 4 - Locations of existing fiber cables for traffic signal communications. (Source FDOT District 5: https://noemi.cflsmartroads.com/div/)

TRANSIT

Winter Park's transit services are provided by LYNX buses, SunRail commuter rail, and Amtrak long distance rail. LYNX is the public agency charged with providing public transportation services to the general public in the Orlando, Florida metropolitan area -- Orange County, Seminole County, and Osceola County. LYNX provides an array of transportation services in the form of fixed route bus services, door-to-door paratransit services, carpool/vanpool services, school pool matching services, and community shuttle service to special events. LYNX serves an area of approximately 2,500 square miles with a resident population of more than 2.3 million people. Small portions of Lake and Polk counties are served as well.

Seven LYNX bus routes operate within Winter Park with one route operating on 30-minute headways and the rest operating on 60-minute headways. An excerpt of the LYNX system map showing the routes within Winter Park is shown in Figure 5. Five of the routes converge on the Winter Park Village bus transfer center.

SunRail provides commuter rail service to downtown Winter Park with trains scheduled every 30 minutes (northbound and southbound) during the morning and afternoon peak periods. Mid-day service is every 2 hours. Service runs from 5:30 am to 9:30 pm on weekdays. SunRail does not operate on weekends except on some occasions. Amtrak operates long distance rail with daily service to the Winter Park station on the Silver Meteor and Silver Star national routes.

- LYNX 30-minute service in Winter Park:
  - Route 102 (Orlando – WP Village – Fern Park)

- LYNX 60-minute service in Winter Park:
  - Route 1 (WP Village – Maitland – Altamonte Mall)
  - Route 6 (Runs along General Rees Ave, Glenridge Wy, and Lakemont Ave)
  - Route 9 (Calvary Towers – WP Village – Rosemont)
  - Route 13 (Runs along General Rees Ave, Glenridge Wy, and Lakemont Ave)
  - Route 23 (Calvary Towers – Rosemont – Springs Village)
  - Route 443 (Advent Health – WP Village – Rosemont)

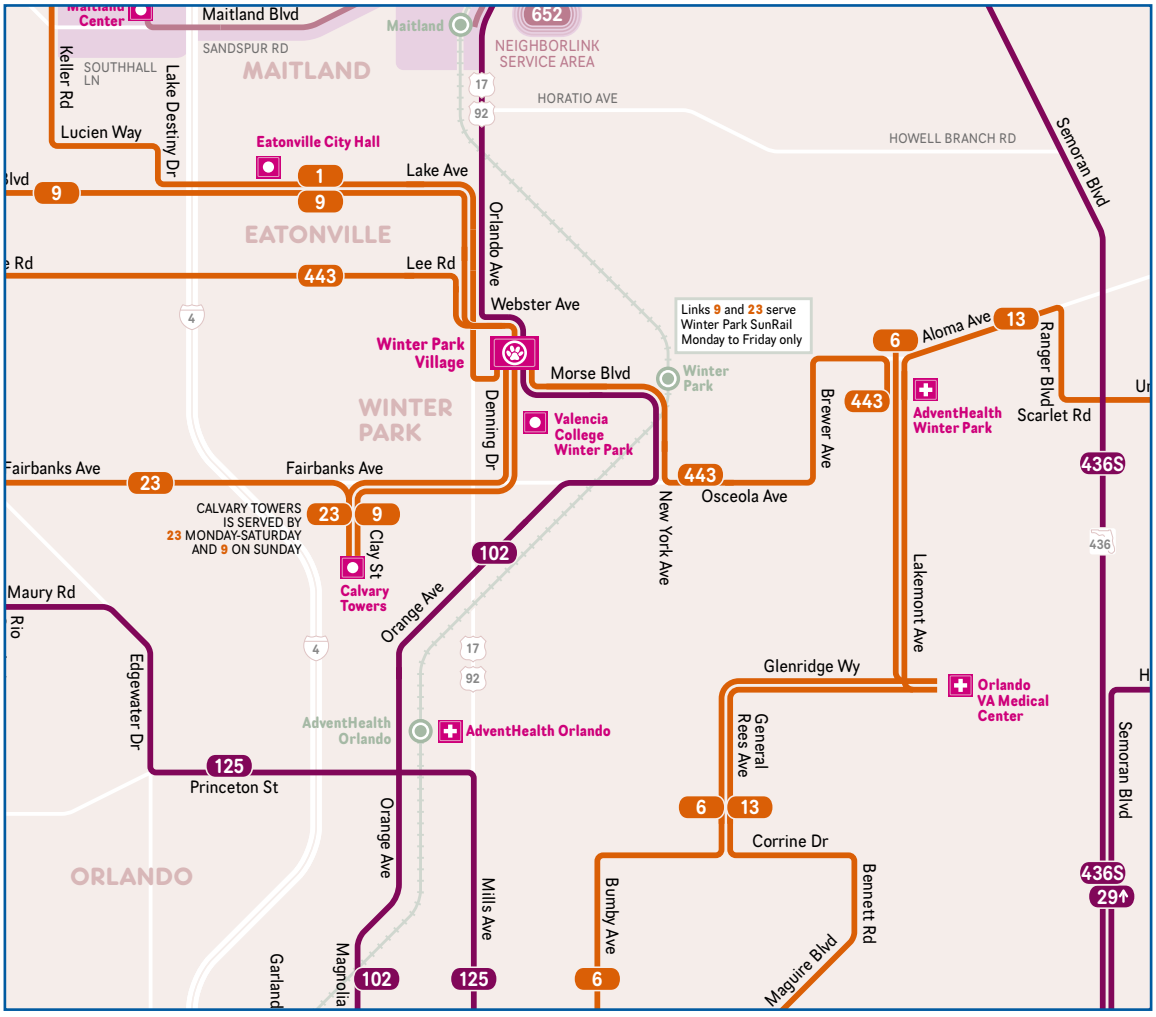


Figure 5 - LYNX Transit Routes through Winter Park (https://www.golynx.com/maps-schedules/map-gallery.stml)

TRANSPORTATION METRICS

The previous chapter identified the baseline of existing transportation infrastructure in Winter Park. This chapter examines and measures the operation and performance of that infrastructure. The purpose of measuring performance is to identify issues and directly inform the prioritization of projects. The evaluation and corresponding factors considered for prioritizing projects fall under the following three categories:

- Traffic safety
- Network quality and connectivity
- Operational reliability

TRAFFIC SAFETY

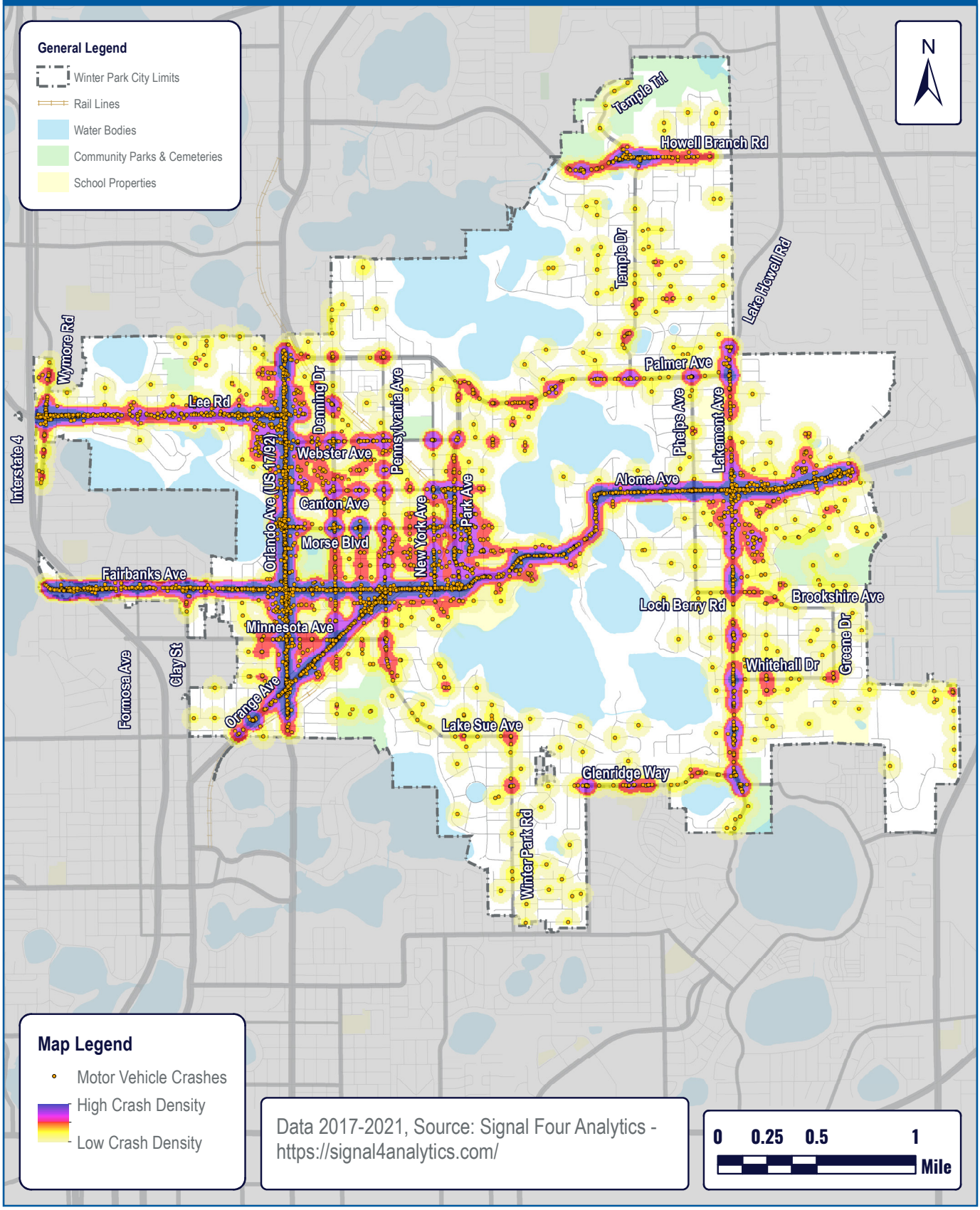
The primary metric for evaluating Winter Park's transportation system is safety. A reduction in vehicle related crashes, injuries, and fatalities has a major impact on public health. It is estimated that in the first half of life, more Americans die from motor vehicle crashes than any other cause, including cancer or the flu. These injuries and fatalities often cause a shift in productivity, decreased property values, and a disruption to social services, further breaking down the health of a community.

A review of traffic crash locations across Winter Park shows that incidents happen in all parts of the city. Overall, the concentrations of motor vehicle crashes are greater as the volumes and speeds of traffic increases (Map 10). Crashes involving vulnerable roadway users such as pedestrians and bicyclists are clustered in commercial areas, which is where higher numbers of people are walking (Map 11). In both instances, the proportional concentration of crashes relative to use indicates that systemic changes are needed to address the root causes of traffic crashes.

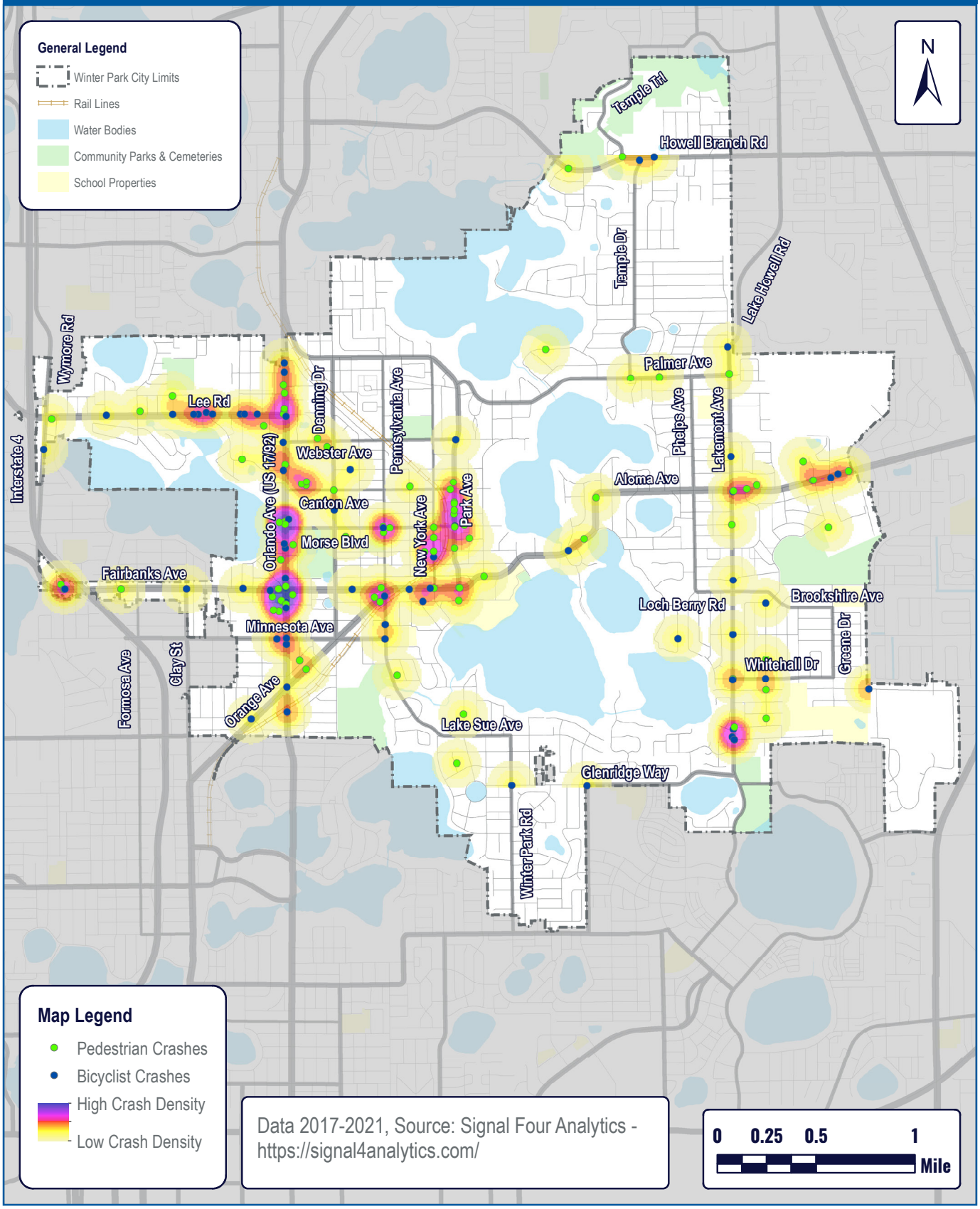
For both motorists and people outside of cars, the impact of lower traffic speeds on injury reduction is evident. Particularly in commercial areas where pedestrian traffic is greatest and encouraged, designing streets using a context-sensitive maximum operating speed for motorists can be expected to decrease crash severity and improve safety. The posted speed limits within Winter Park are shown in Map 12.

Vision Zero is a worldwide planning initiative that establishes the target of completely eliminating traffic crash fatalities. MetroPlan Orlando was awarded a 2022 Safe Streets and Roads for All (SS4A) federal grant to develop Vision Zero Safety Action Plans for each jurisdiction across the MPO planning area. Building upon the TMP metrics and work program, Winter Park will collaborate with MetroPlan Orlando to conduct community engagement and follow a data-driven process to identify low-cost, high-impact solutions with a goal of fully eliminating traffic fatalities.

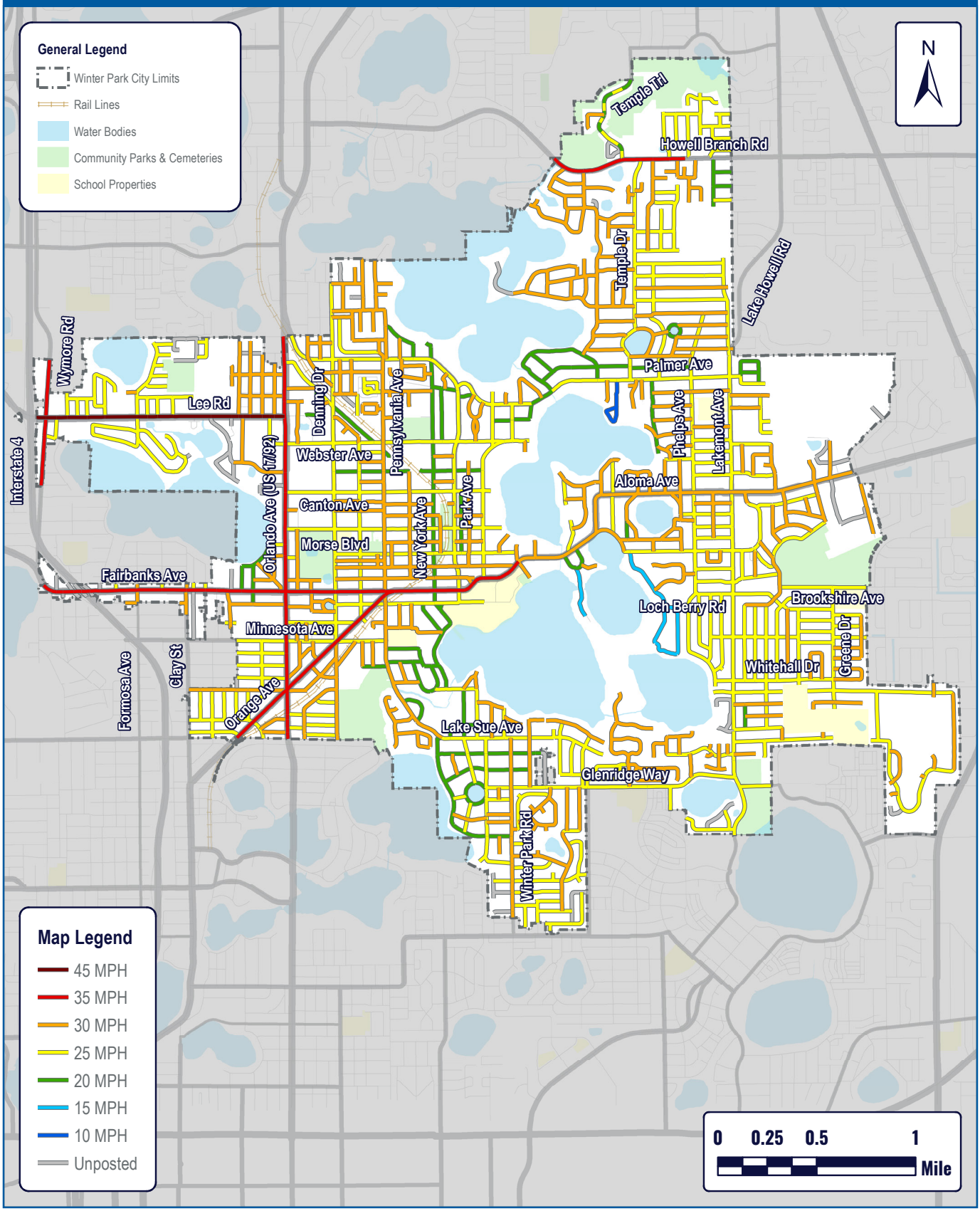
Map 10 – Motor Vehicle Crashes (2017-2021)



Map 11 – Vulnerable Roadway User Crashes (2017-2021)



Map 12 – Posted Speed Limits



NETWORK QUALITY AND CONNECTIVITY

Connectivity refers to the level of connectedness within the transportation system. Regardless of mode choice, it is essential to have an uninterrupted path of travel between your starting point and your destination. A truly robust transportation network provides continuous, comfortable routes for all forms of transportation, including motor vehicles, transit systems, bicycles, and pedestrians. Unfortunately, we do not live in an ideal environment; therefore, it is important that connectivity be evaluated to identify gaps within the network. Obstacles can come in a variety of forms. For example, congestion can be a temporary hindrance for motorists traversing the roadways. Alternatively, a missing curb ramp becomes a permanent barrier for disabled people traveling along the sidewalk.

The City of Winter Park has a robust roadway network with arterial and collector roadways traversing the city, complemented by a grid network of local streets in the downtown and in surrounding neighborhoods. Motorists have largely unhindered access throughout the city; however, there are some obstacles to vehicular travel within the city. The chain of lakes at the center of Winter Park limits the number of east-west connections. The lakes are a permanent barrier that cannot be addressed by adding roadways to the network. Congestion during peak hours and events acts as a temporal hindrance for vehicular travel within Winter Park. The ability to make left turns along the major arterials can become considerably challenging during congested times where there are few gaps in opposing traffic. Special events bring the added challenge of finding parking, which can sometimes result in cars circling city streets, thereby exacerbating traffic concerns.

The connectivity for people on foot or bicycle is more dependent on personal experience and the relative comfort of the environment provided. Whereas the roadway network for motorists is measured in miles, the connectivity of the transportation system for people in a wheelchair is measured in inches and a missing curb ramp or section of sidewalk can prevent travel entirely. Alternatively, the lack of a marked crossing at a particular location could discourage able-bodied people from crossing simply because they feel it is unsafe to do so. Providing a connected network of comfortable facilities and routes is a primary objective and factor for prioritizing City investments and projects in the next chapter.

It is useful to measure the actual conditions experienced by people walking and bicycling, which leads to measuring the Level of Traffic Stress for people walking or bicycling as presented in the following sections.

Pedestrian Level of Traffic Stress

The leading contemporary method used to evaluate conditions for people walking is Pedestrian Level of Traffic Stress (LTS). Based on empirical research over the past decade, the pedestrian LTS for a given street spans from conditions that are comfortable and appealing to all users to conditions that may be impassable for some people and used only due to limited route options. Figure 6 graphically shows the decreasing types of pedestrians that feel comfortable as the pedestrian LTS worsens.

Sidewalks on both sides of the street with lower traffic speeds and more separation/buffer from the roadway are preferred for safety and comfort.

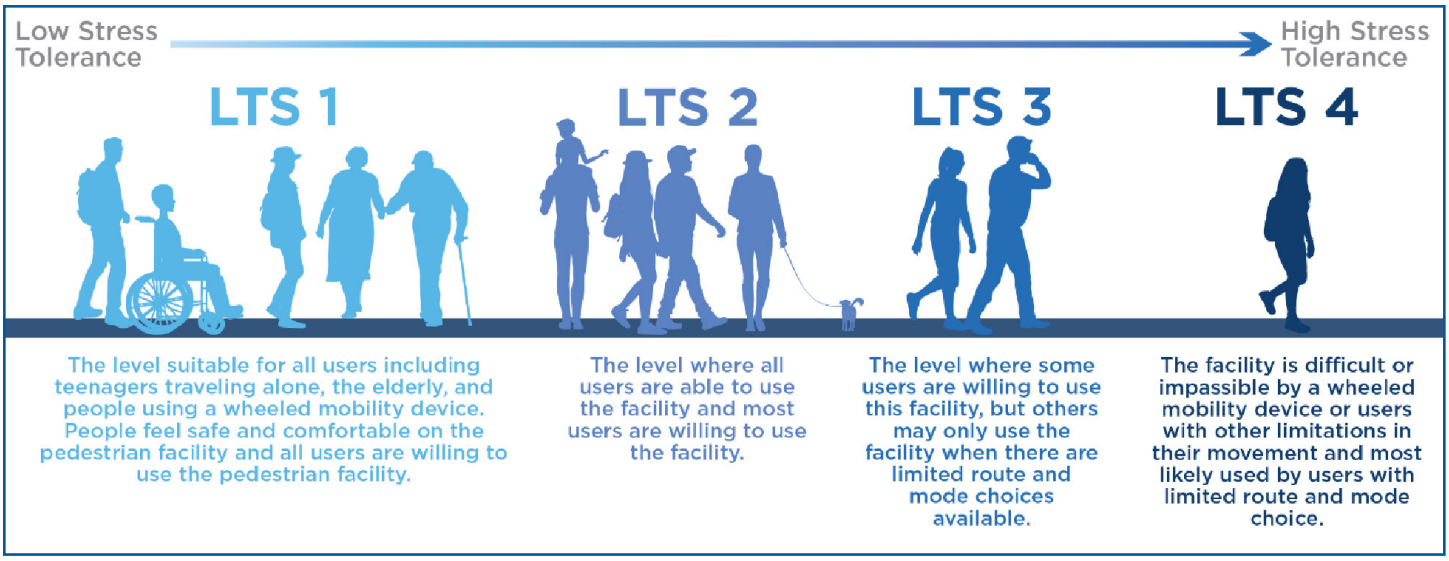


Figure 6 - Pedestrian Level of Traffic Stress by user type. (Source: FDOT 2023 Multimodal Quality/Level of Service Handbook)

Most residential streets generally provide comfortable conditions for walking because of the low traffic volumes and speeds. Utilizing data for the roadways functionally classified as collectors and arterials as summarized in the Transportation Network Baseline chapter and following the latest guidance published by FDOT in 2023, the following factors determine the pedestrian LTS for a given street, with the results shown in Map 13.

- Presence and width of sidewalk adequately on one or both sides.
- Posted speed limit.
- Presence of lateral and/or vertical separation between the roadway edge and sidewalk.

Bicycle Level of Traffic Stress

Different people have different levels of comfort bicycling in traffic. Industry practice has identified four generalized types of bicyclists based on skill and experience level: children and elderly, interested but concerned, enthused and confident, strong and fearless. The small proportion of the population who consider themselves strong and fearless bicyclists can navigate even the most stressful streets, but most bicyclist types cannot, which can decrease the viability of bicycling even short distances. An evaluation of the relative comfort of a given street for bicycling by these defined user groups is accomplished by mapping the Bicycle Level of Traffic Stress (LTS). Figure 7 shows the decreasing range of bicyclists that feel comfortable on a given roadway as the bicycle LTS worsens.

Bicycle LTS is calculated by utilizing data for the roadways functionally classified as collectors and arterials as summarized in the Transportation Network Baseline chapter. Following the latest guidance published by FDOT in 2023, calibrated to the roadway network conditions experienced by bicyclists in Winter Park, the following factors determine the bicycle LTS for a given street, with the results shown in Map 14.

- Posted speed limit.
- Number of travel lanes.
- Volume of motor vehicles.
- Type of land use - commercial or residential.
- The presence, width, and vertical separation of an existing bicycle facility.

Low speed and low traffic streets are preferred whether or not there is a dedicated bicycle facility, and more separation is preferred when there is a dedicated bicycle facility.

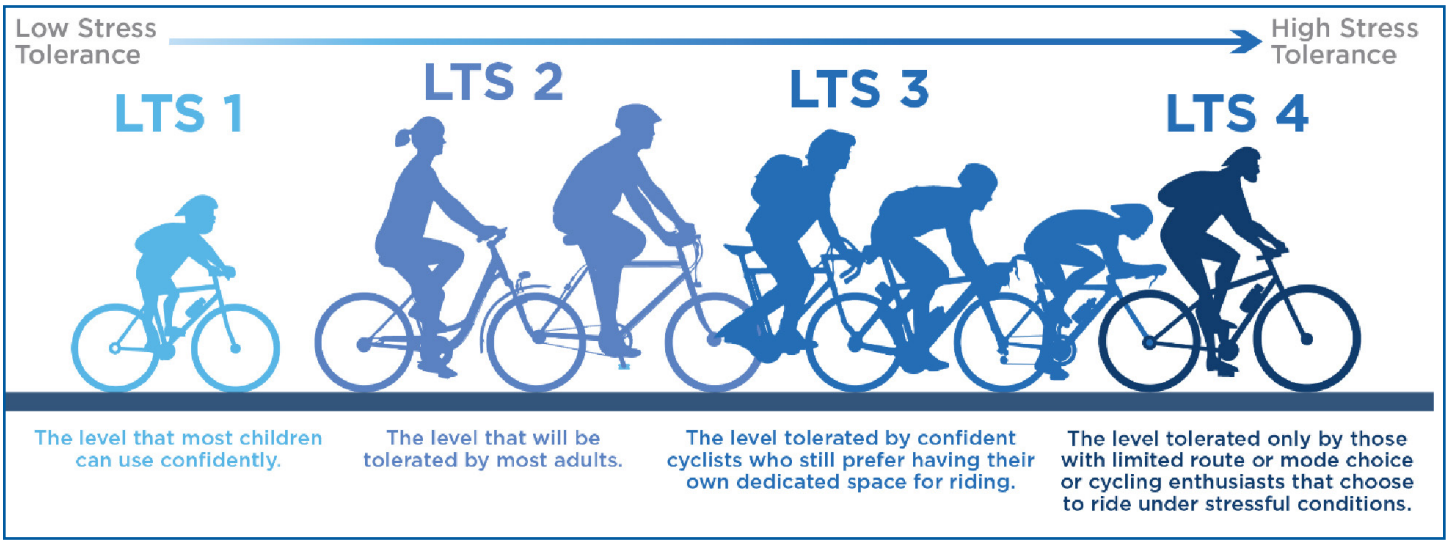
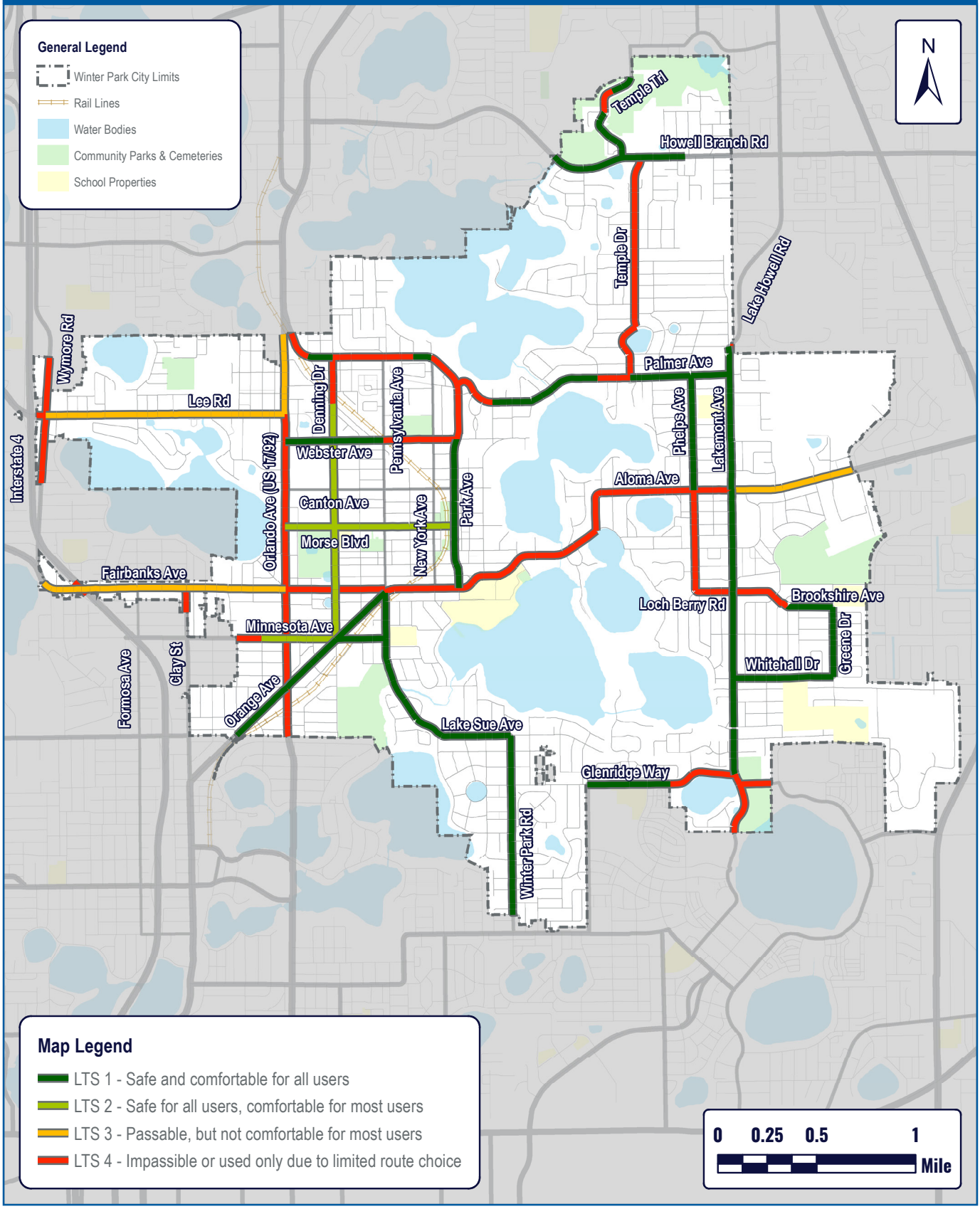
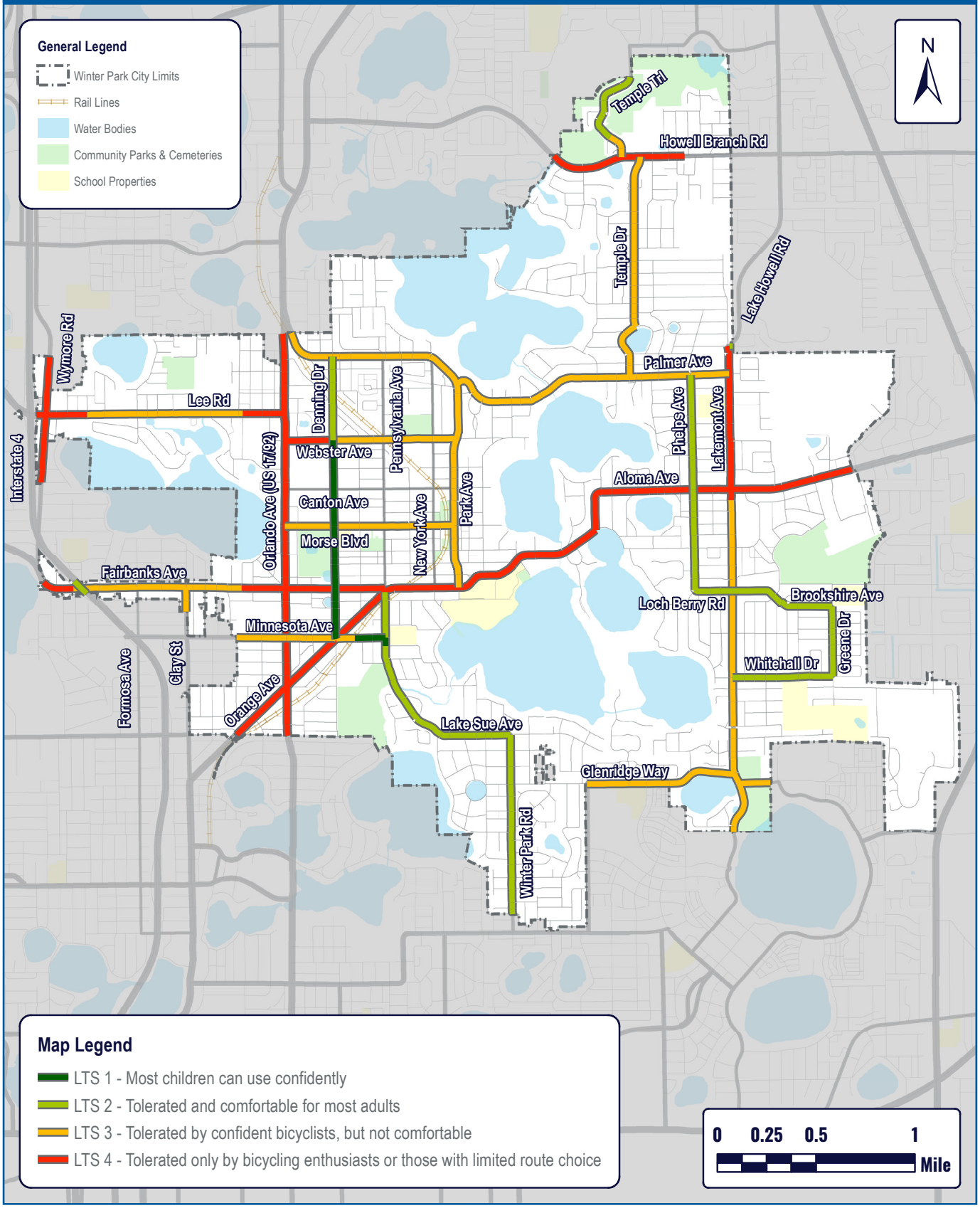


Figure 7 - Bicycle Level of Traffic Stress by user type. (Source: FDOT 2023 Multimodal Quality/Level of Service Handbook)

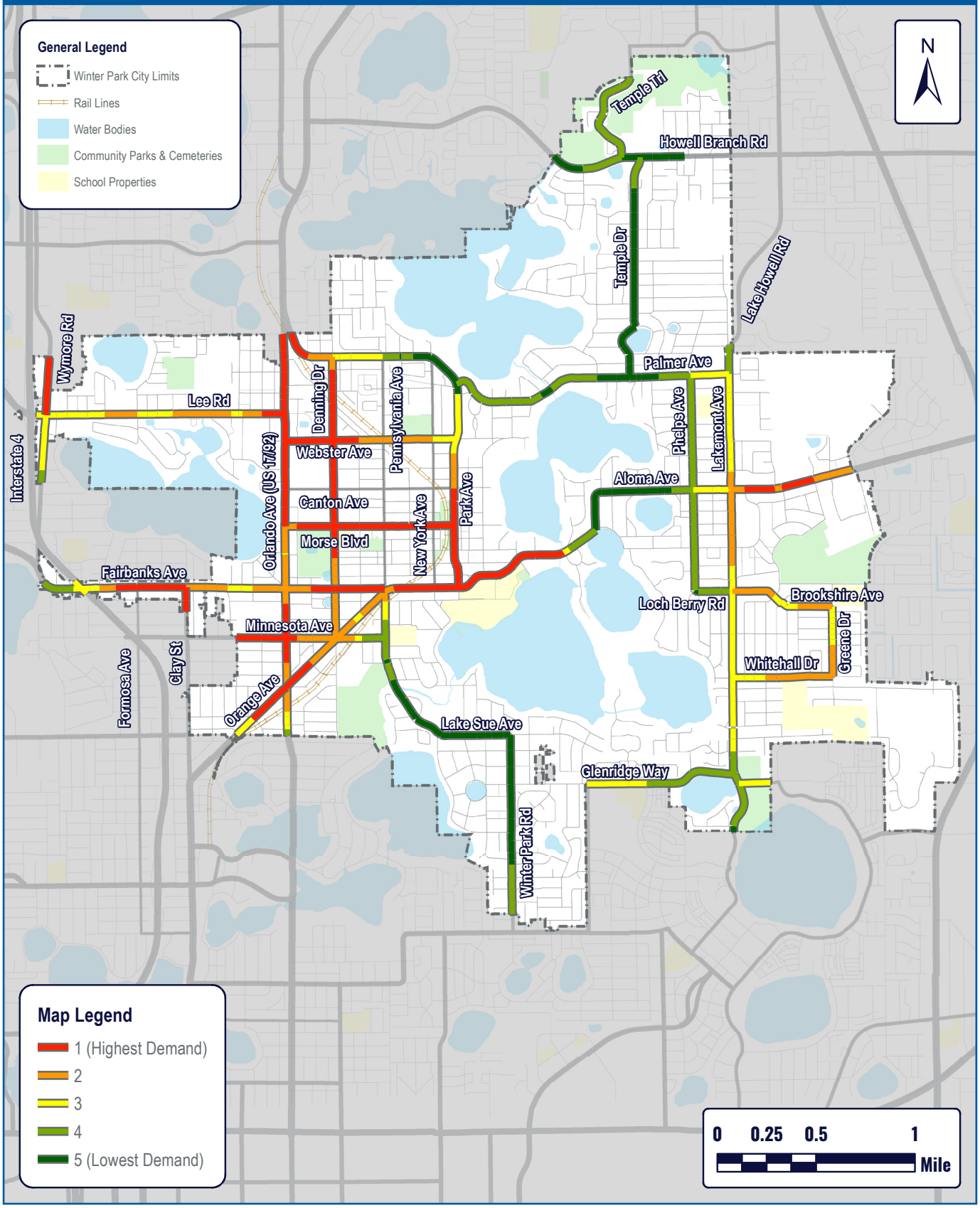
Map 13 – Pedestrian Level of Traffic Stress (LTS)



Map 14 – Bicycle Level of Traffic Stress (LTS)



Map 15 – Pedestrian Latent Demand



Pedestrian Latent Demand

The City would like to see more travel accomplished through active modes like walking and bicycling. While calculating LTS can measure the existing comfort of a roadway segment, there is a need to identify where there is a high propensity for walking based on proximity to trip origins and destinations. A useful way to visualize Winter Park's land use mix and demand for walking is via Pedestrian Latent Demand. The resulting map reflects the land use mix likely to encourage walking, based on projected 2045 data for employment, population, and school enrollment (Map 15).

OPERATIONAL RELIABILITY

The third and final way to measure the operations of Winter Park's transportation system is by counting usage and comparing it to capacity where applicable. Motor vehicles are made of metal and have designated travel lanes, making them easy to count. Similarly, transit ridership can be measured by capturing the number of people getting on or off at stops and stations. By contrast, people walking and bicycling are notoriously difficult to count. Correspondingly, vulnerable roadway user crashes and pedestrian latent demand introduced in the previous sections are valuable proxies for understanding where people are, or would like to be, walking and bicycling.

Traffic & Technology

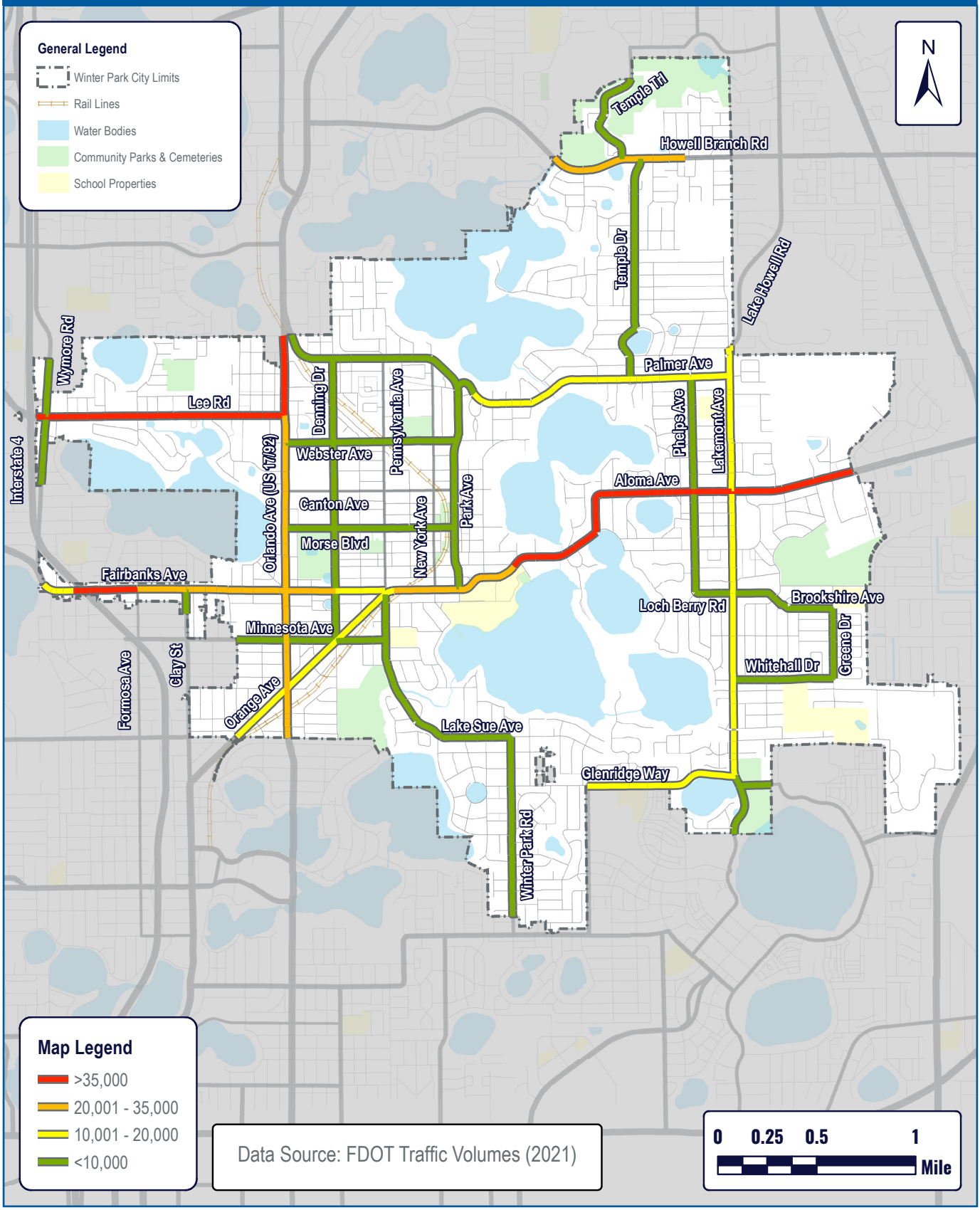
Annual Average Daily Traffic (AADT) (Map 16) is the measure used to approximate the daily volume of motor vehicle traffic carried on a segment of roadway. AADT is determined by collecting 24-hour traffic counts at multiple times in a year and then averaging the counts to account for seasonal fluctuations. An analysis and planning tool called Level of Service (LOS) (Map 17) puts the AADT in context by comparing the measured traffic volume with each roadway's expected capacity. Evaluating the resulting LOS scores can then help identify parts of the roadway network that may expect to be congested during peak hours.

The system-level calculation of LOS completed in the TMP follows the Generalized Tables method within the FDOT 2023 Multimodal Quality/Level of Service Handbook. The method establishes LOS score thresholds for the range of typical land use contexts found across Florida. Winter Park's typical land use most closely aligns with the C4-Urban General category within FDOT's Context Classification system. A roadway's measured AADT is then adjusted based on whether there are medians, left turn lanes, right turn lanes, and whether the roadway is a state highway. Each roadway segment in Winter Park has thus been assigned a LOS score based on the roadway configuration adjusted AADT, the number of travel lanes, and the C4 land use context.

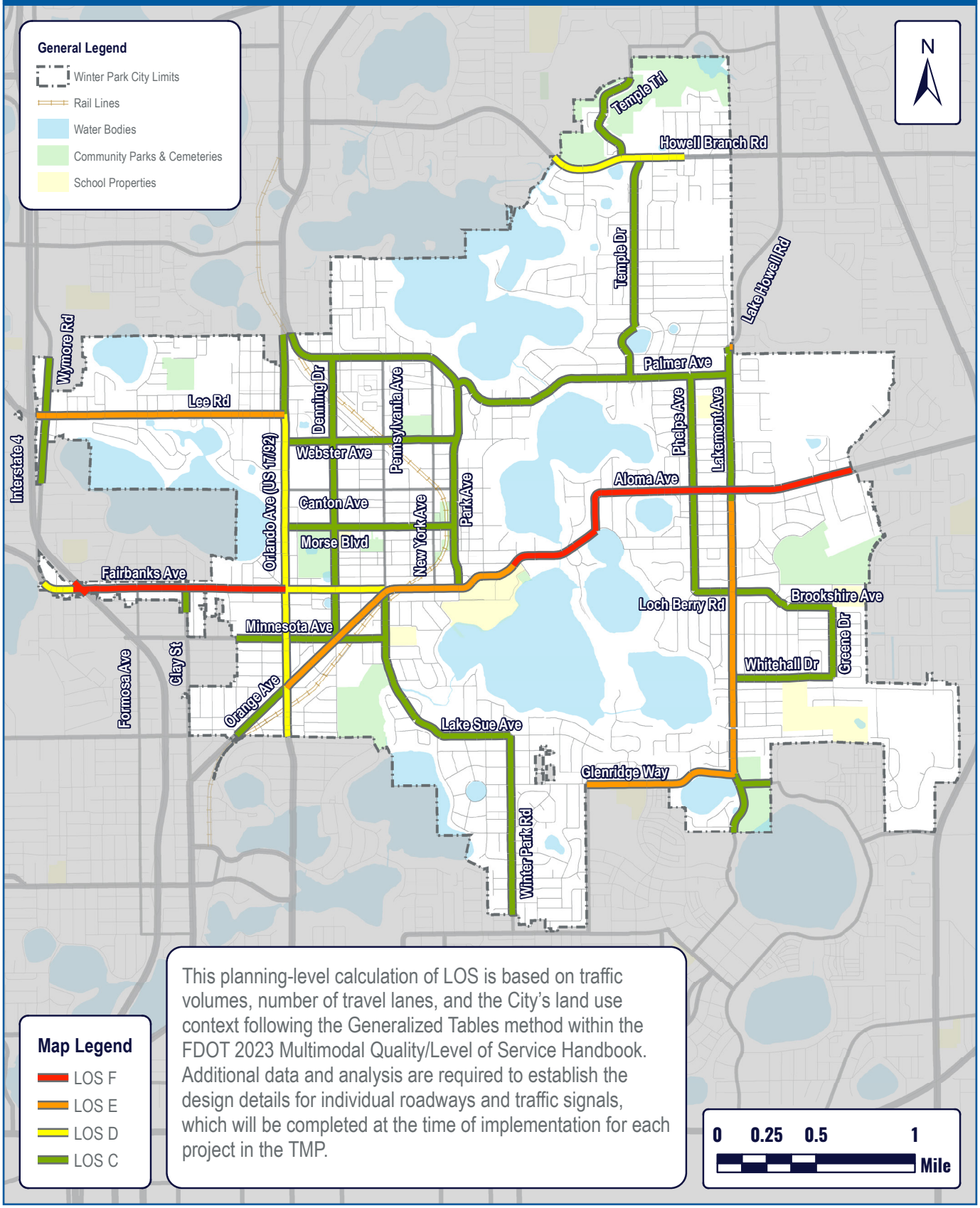
As compared to the generalized calculations completed for the TMP at a systemwide network level and using AADT, it should be noted that additional data and analysis is needed for the design of individual roadways and traffic signals. The collection of peak-hour traffic counts and analysis of individual intersection operations can quantify the extent of peak hour traffic congestion and inform specific design needs. That data collection and analysis will correspondingly be completed at the time of implementation and design for each of the projects in the TMP.

Every second matters when responding to an emergency situation, and intersections can create bottlenecks that slow emergency response times. Emergency Vehicle Preemption provides a way for fire, rescue, and police vehicles to communicate with traffic signals to help clear intersections for approaching emergency vehicles. Winter Park currently uses Opticom GPS system and is working with FDOT and product vendors to complete the last set of signals. At this time, the Opticom system is considered adequate to serve the needs and no additional emergency vehicle preemption technology is recommended.

Map 16 – Annual Average Daily Traffic (AADT)



Map 17 – Motor Vehicle Level of Service (LOS)



Transit

Over the last few years, there have been changes in the travel patterns of LYNX customers due to the introduction of SunRail, an improving economy, low gas prices, and the COVID-19 pandemic. More than 79,000 rides were provided systemwide by LYNX each weekday pre-pandemic. Post pandemic sees 55,000 rides provided systemwide by LYNX each weekday. The following ranking shows the FY 2022 ridership of LYNX routes that pass through Winter Park.

- LYNX 30-minute service in Winter Park:
  - Route 102 (Orlando – WP Village – Fern Park) – 353,661 rides

- LYNX 60-minute service in Winter Park:
  - Route 13 (Runs along General Rees Ave, Glenridge Wy, and Lakemont Ave) – 149.254 rides
  - Route 443 (Advent Health – WP Village – Rosemont) – 141,648 rides
  - Route 9 (Calvary Towers – WP Village – Rosemont) – 86,169 rides
  - Route 23 (Calvary Towers – Rosemont – Springs Village) – 71,683 rides
  - Route 1 (WP Village – Maitland – Altamonte Mall) – 42,208 rides
  - Route 6 (Runs along General Rees Ave, Glenridge Wy, and Lakemont Ave) – 20,162 rides

The Winter Park station has the second highest ridership in the SunRail system of 16 stations. 75,770 people got on or off SunRail at the Winter Park station from July 2021-May 2022, compared to the busiest station which reported 85,413 riders at the downtown Orlando LYNX terminal. On Amtrak, Winter Park station served 12,993 riders from October 2020-September 2021.

CAPITAL PROJECTS

The capital projects outlined in the following section are the physical infrastructure needed to connect and improve the transportation networks for all modes of travel. The recommendations were pulled largely from projects that have been long needed and studied in Winter Park. New project concepts were developed based on review of the baseline operations in collaboration with City staff. All projects have been subsequently screened for feasibility and conformance with the applicable local, state, and federal design standards and guidance.

The projects are grouped into categories of similar types of facilities. Projects have been assigned prioritization within each category to indicate the relative project readiness and order that they would be pursued for implementation. However, it is essential to note that each project included in the TMP could be implemented whenever the opportunity arises through funding opportunities, adjacent development, or any other newly identified considerations. Project prioritization within each category was developed through a combination of factors including the transportation metrics introduced in the previous chapter, feedback received at presentations, a planning-level review of constructability, and potential for significant progress on developing connected networks across all parts of Winter Park.

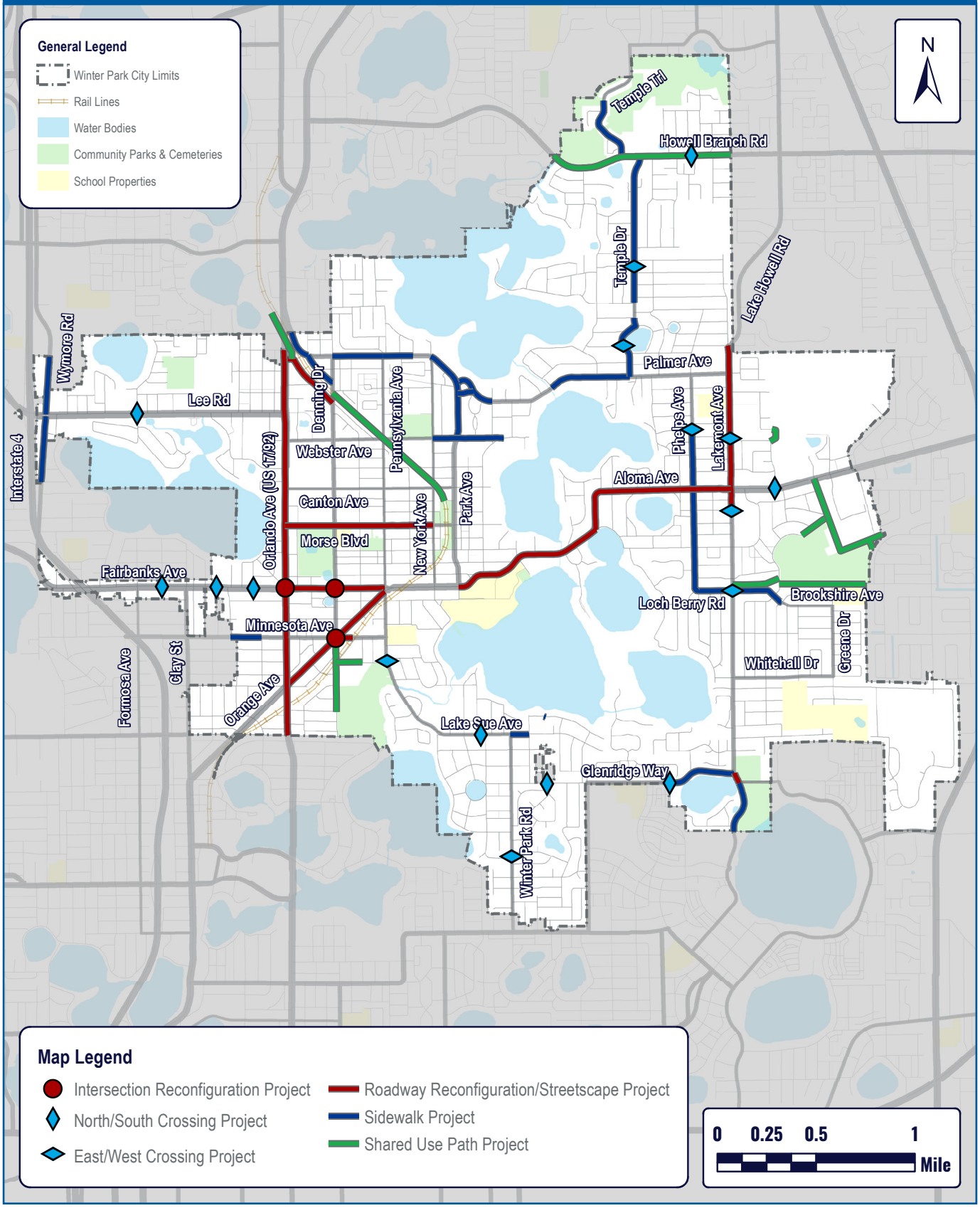
Cost estimates for each recommendation are included in Appendix B. The estimates have been developed using pay items and expected unit costs sourced from FDOT District 7, the FDOT's Long Range Estimating (LRE) system, and engineering judgement. The planning-level estimates include percentage-based multipliers applied to the construction costs for unknowns, design, maintenance of traffic, and construction inspection. Any needed right-of-way acquisition is not included in the estimates.

The five categories of projects and the total cost estimate for all projects are summarized in Table 2. The TMP identifies a suite of new transportation projects that are cumulatively expected to cost over $150M over the planning horizon of 20 years. To implement the full work program would correspondingly require an annual investment of approximately $7M. All Projects are shown on Map 18.

TABLE 2: SUMMARY OF CAPITAL PROJECTS

Project Category	20-Year Cost Estimate	Annual Cost Estimate
Sidewalk Projects	$14,222,000	$711,100
Shared Use Path & Greenway Projects	$23,866,000	$1,193,300
Crossing Projects	$14,415,000	$720,750
Roadway Reconfiguration & Streetscape Projects	$69,480,000	$3,474,000
Technology Projects	$19,625,000	$981,250
Capital Projects Total	**$141,608,000**	**$7,080,400**

Map 18 – All Projects



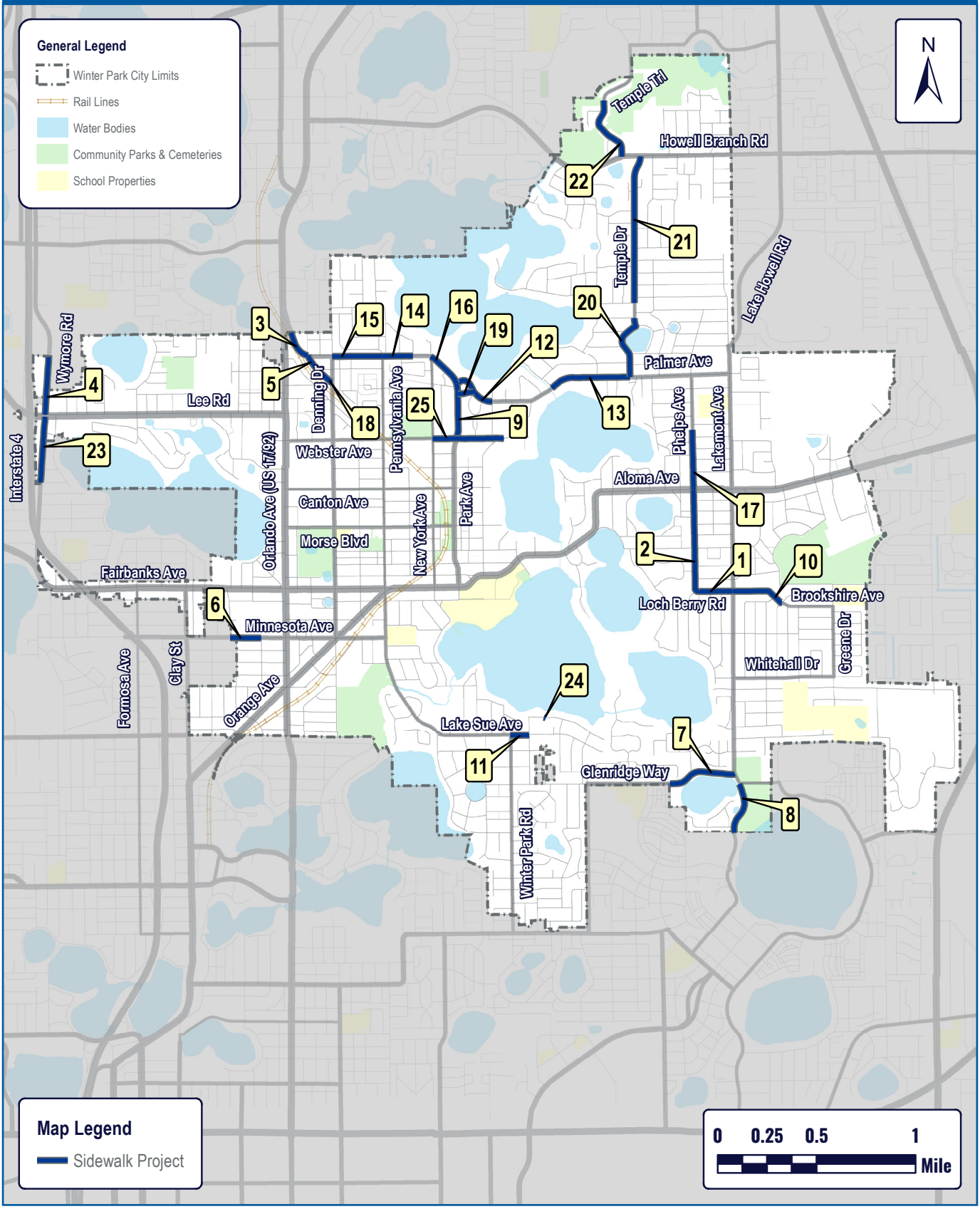
SIDEWALK PROJECTS

The first category of projects is sidewalks, reflecting the value placed on walking. While Winter Park has a robust and quality network of sidewalks, the following projects fill gaps in the network. Network quality and connectivity was introduced in the Transportation Metrics chapter. Correspondingly, the highest priority sidewalk projects are roadways where they are missing from both sides of the street or to fill gaps in the network and allow continuous travel. Moving down the list of priorities are projects that add sidewalk to streets with existing sidewalk on one side and more fully complete the network. The TMP sidewalk projects are shown on Map 19 and listed in Table 3.

TABLE 3: SIDEWALK PROJECTS

Priority	Roadway	Location	Improvements	Cost Estimate
1	Loch Berry Road	Phelps Avenue to Lakemont Avenue	Both sides missing	$1,892,000
2	Phelps Avenue	Loch Berry Road to Aloma Avenue	East side	$445,000
3	Park Avenue	Ridgewood Avenue to City Limit (N)	Both sides incomplete	$1,356,000
4	Wymore Road	Lee Road to City Limit (N)	Both sides missing	$1,402,000
5	Louisiana Avenue	Park Avenue to Wilma Avenue	Both sides missing	$76,000
6	Minnesota Avenue	Nicolet Avenue to Schultz Avenue	North side gap	$267,000
7	Glenridge Way S	St. George Street to Lakemont Avenue	South side - includes boardwalk	$1,544,000
8	Lakemont Avenue	Gray Avenue to Glenridge Way	West side - includes boardwalk	$442,000
9	Park Avenue	Webster Avenue to Palmer Avenue	West side	$253,000
10	Loch Berry Road	Lakemont Avenue to Darcy Drive	South side	$259,000
11	Lake Sue Avenue	Winter Park Road to Laurel Road	North side	$84,000
12	Palmer Avenue	Park Avenue to Old England Avenue	South side	$105,000
13	Palmer Avenue	Alabama Drive to Temple Drive	North side	$146,000
14	Park Avenue	Green Cove Road to Pennsylvania Avenue	North side	$138,000
15	Park Avenue	Pennsylvania Avenue to Denning Drive	South side	$317,000
16	Park Avenue	Palmer Avenue to New York Avenue	South side	$232,000
17	Phelps Avenue	Aloma Avenue to Lakehurst Avenue	West side	$259,000
18	Louisiana Avenue	Wilma Avenue to Denning Drive	Both sides	$326,000
19	Stovin Avenue	Park Avenue to Palmer Avenue	North side	$65,000
20	Temple Drive	Palmer Avenue to Woodmere Drive	West side	$291,000
21	Temple Drive	Via Lugano to Howell Branch Road	West side	$1,726,000
22	Temple Trail	Howell Branch Road To 300' N of Cove Trail	East side	$426,000
23	Wymore Road	Franklin Avenue to Lee Road	West side	$958,000
24	Virginia Drive	Dead End	Curb and sidewalk	$688,000
25	Webster Avenue	Pennsylvania Avenue to Interlachen Avenue	South side	$525,000
				$14,222,000

Map 19 – Sidewalk Projects



SHARED USE PATH & GREENWAY PROJECTS

Building upon the sidewalk network, shared use paths provide similar connections for people walking, but have added width to accommodate greater numbers of people walking as well as people riding bicycles. Shared use paths may follow roadways, but they may also follow their own alignments or make connections through green spaces. The highest priority shared use path projects make connections that do not exist, providing safer and shorter travel route options for people walking or bicycling. The TMP Shared Use Path Projects are shown in Table 4 and Map 20. The Greenway Route Projects are shown in Table 4 and Map 21. Several shared use path projects are currently underway and have progressed through several stages of planning, design, and funding.

- **Denning Drive** – pathway along the west side between Webster Avenue and Solana Avenue. Construction is imminent, so not included in the list of projects with a cost estimate.
- **St. Andrews Trail** – Pathway leading along St. Andrews Boulevard from Aloma Avenue south to the Parks and Recreation Maintenance Facility, then continuing east with connections to the Cady Way Trail.
- **Tennis Center Trail** – Pathway along the south side of the park connecting Denning Drive to Melrose Avenue.
- **Cady Way** - Reconfiguration of the separated bikeway between Perth Lane and the Cady Way Trail.

Bicycling is flexible, meaning multiple types of facilities can meet travel needs. Sidewalks, shared use paths, and designated on-street bicycle routes can all provide safe and comfortable route options. While shared use paths are designed to be comfortable for all ages and experience levels, some of the most desirable places to bicycle are low-speed and low-traffic volume roadways. Identifying these roadway segments as part of a connected network called Greenway Routes can expand bicycle travel options where it is not necessary or desirable to create dedicated, exclusive space for bicycling on these streets. These Greenway Routes projects connect key destinations and parks, build on the City's successful traffic calming deployments, and further discourage pass-through traffic on neighborhood streets. A system of greenway routes includes three main design tools:

- Traffic calming in coordination with the Speed Management & Traffic Calming Policy,
- Enhanced crossings at larger streets (addressed as its own projects category), and
- Wayfinding and other signage/mapping.

A comprehensive system of wayfinding signs (Figure 8), accompanied by a City Bike Map, can tie all of these different types of facilities together. Further, designating routes and providing guidance to people bicycling can lead them to the safest crossing locations where the routes must cross larger roadways. Figure 9 provides an example of a bike map that shows connected and comfortable routes, which also provides the needed details of crossings and what types of facilities to expect on each route. To provide clear direction on the system of routes, the highest priority recommended project in this category is to create a City of Winter Park Bike Map, which in addition to the graphic design of the map product, includes the effort of finalizing the Greenway Routes to be used in those corresponding projects. A City of Winter Park Bike Map would also be a public-facing tool to educate people about accessing civic destinations such as parks, schools, and SunRail without needing a car.

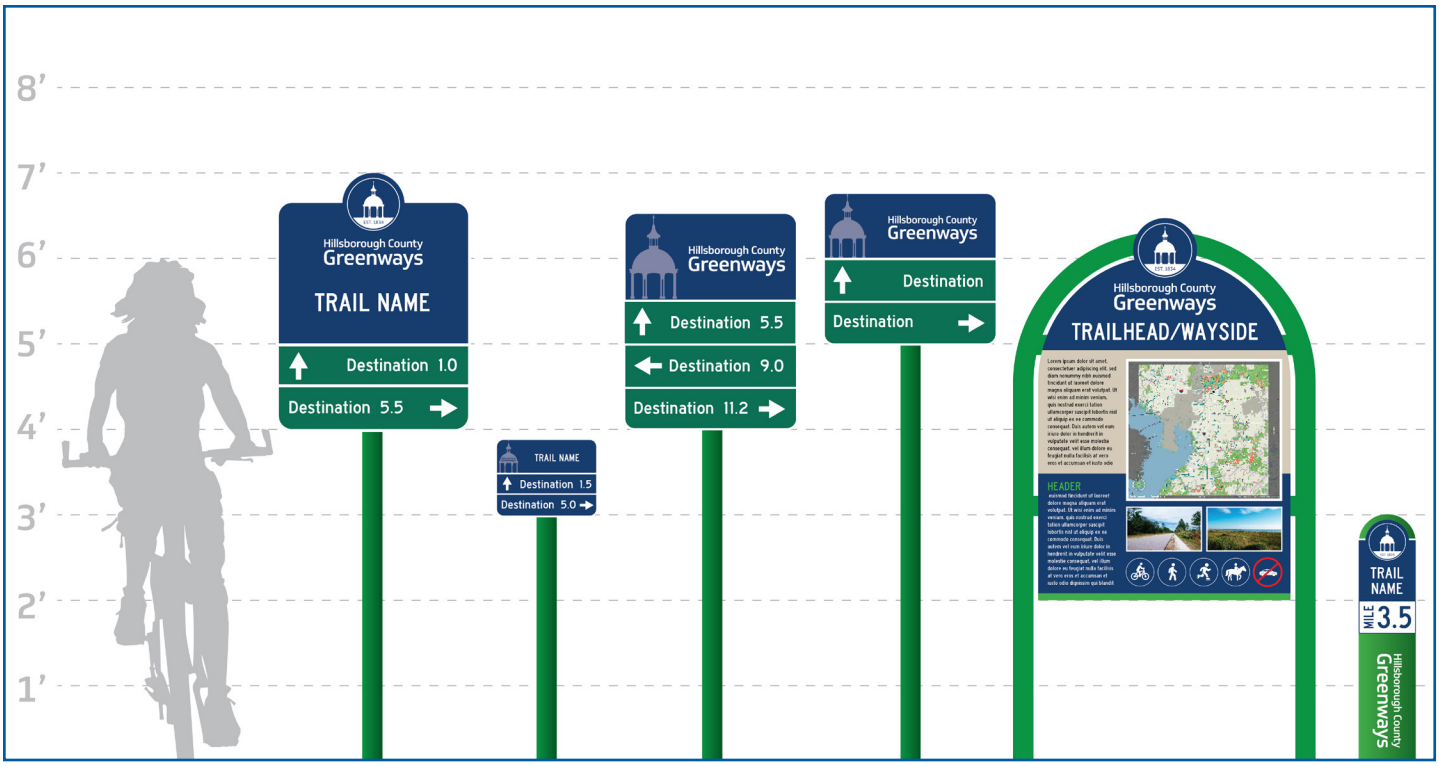


Figure 8 - Example unified system of greenway route wayfinding signage.

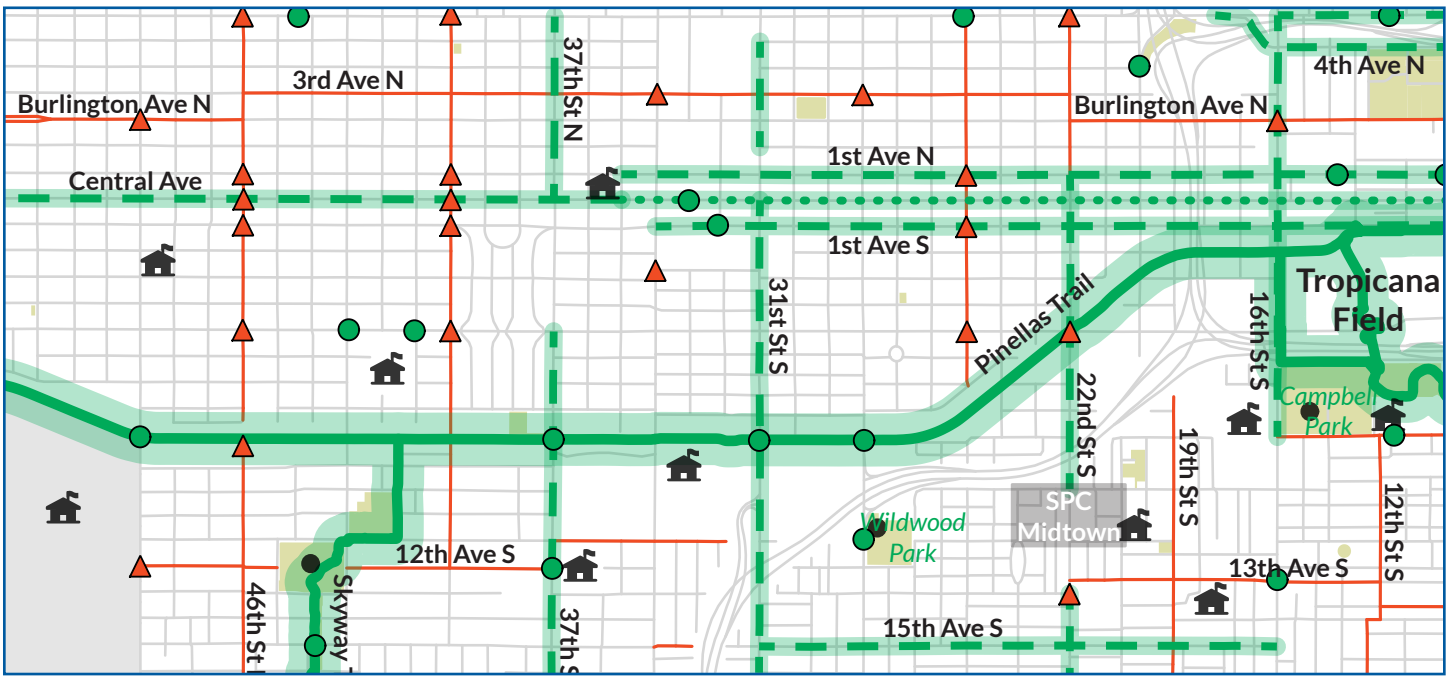
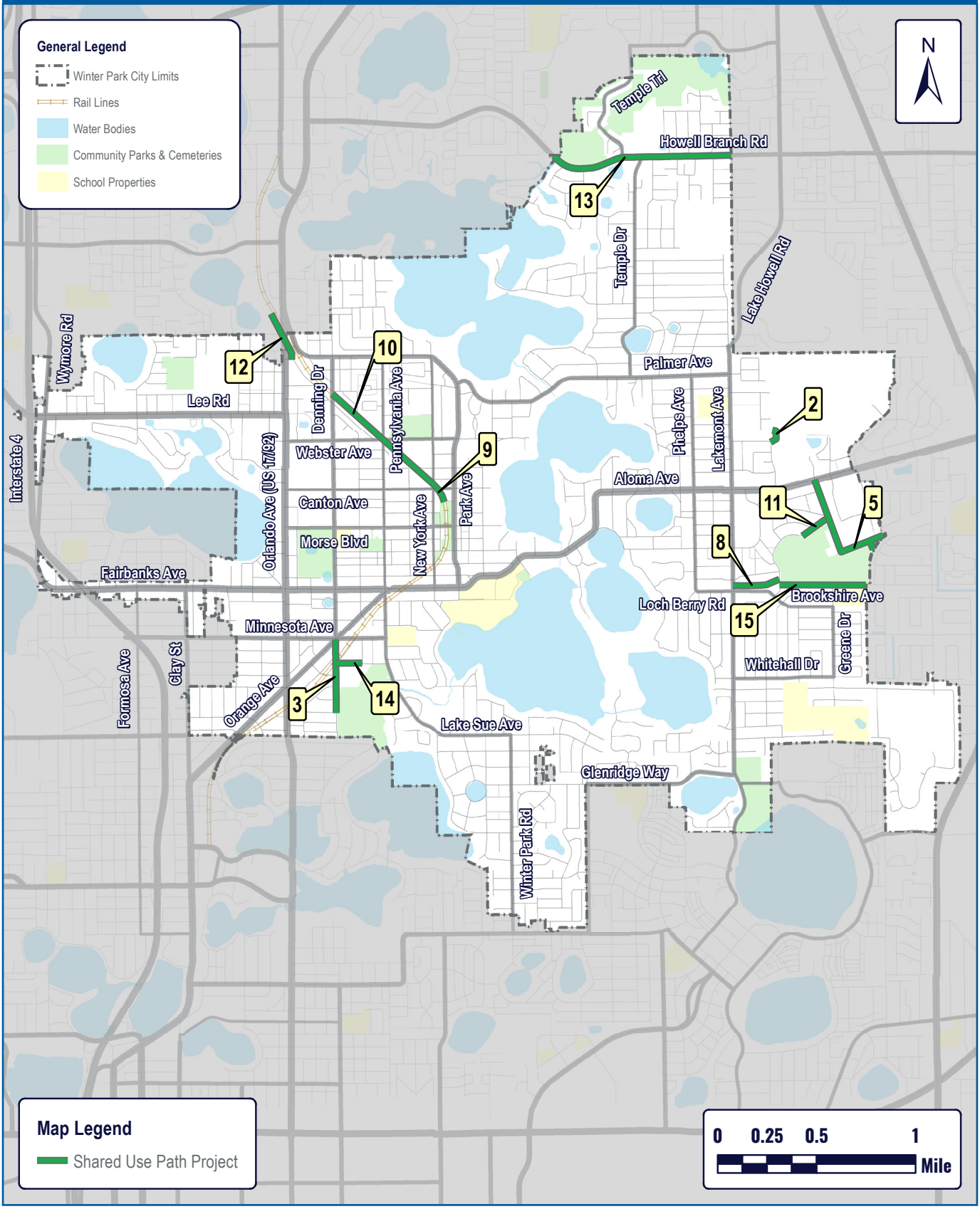


Figure 9 - Snapshot of the St. Petersburg Bike Map, showing facilities, routes, and crossings.(https://www.stpete.org/residents/parks___recreation/cycling_walking_trails.php)

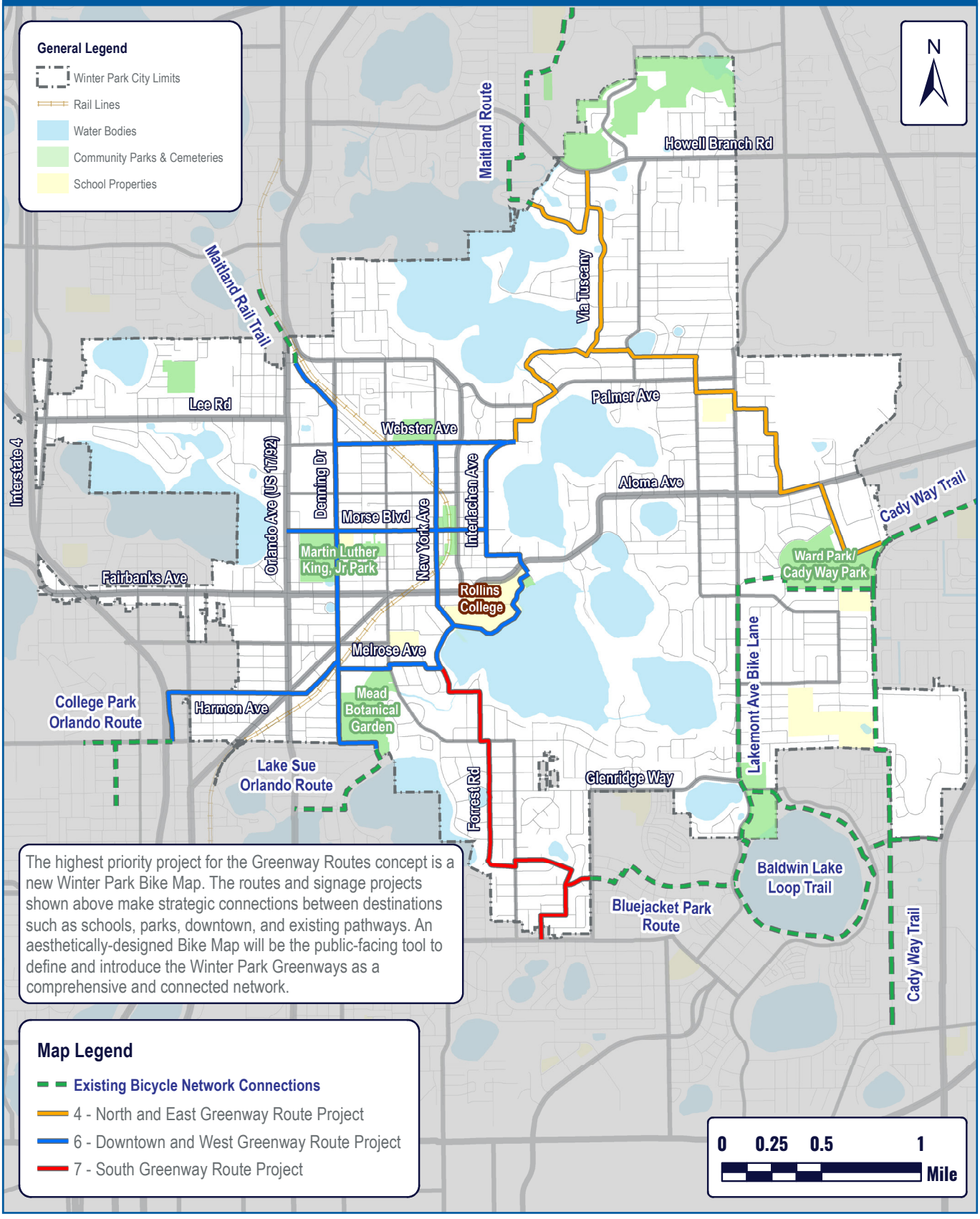
TABLE 4: SHARED USE PATH & GREENWAY PROJECTS

Priority	Roadway	Location	Improvements	Cost Estimate
1	City Bike Map	Citywide	Finalize design and print map	$100,000
2	Northeast Connector Trail	Lander Road to Suffield Drive	Shared use path	$159,000
3	S Denning Drive	Minnesota Avenue to Mead Gardens	Shared use path	$1,233,000
4	Routes: North & East	North/East of Webster Avenue	Signs, sharrows, traffic calming	$142,000
5	St. Andrews Trail	SR 426 to Cady Way Trail	Shared use path	$9,498,000
6	Routes: Downtown & West	Webster Avenue to Oxford Road	Signs, sharrows, traffic calming	$209,000
7	Routes: South	South of Oxford Road	Signs, sharrows, traffic calming	$142,000
8	Church Trail	Perth Lane to Lakemont Avenue	Shared use path	$1,080,000
9	Railroad Trail	New York Avenue to Central Park	Shared use path	$2,176,000
10	Railroad Trail	N. Denning Drive to New York Avenue	Shared use path	$412,000
11	Ward Park Trail	Cady Way Trail to St. Andrews	Shared use path	$602,000
12	17-92 Overpass	Solana Avenue	Overpass & shared use path	$6,578,000
13	Howell Branch Road	Maitland City Line to Seminole Co. Line	Shared use path	$1,535,000
14	Tennis Center Trail	Denning Drive to Melrose Avenue	Current City project	Underway
15	Cady Way	Reconfigure bikeway, Perth Lane to Cady Way Trail	Current City project	Underway
				$23,866,000

Map 20 – Shared Use Path Projects



Map 21 – Greenway Route Projects



CROSSING PROJECTS

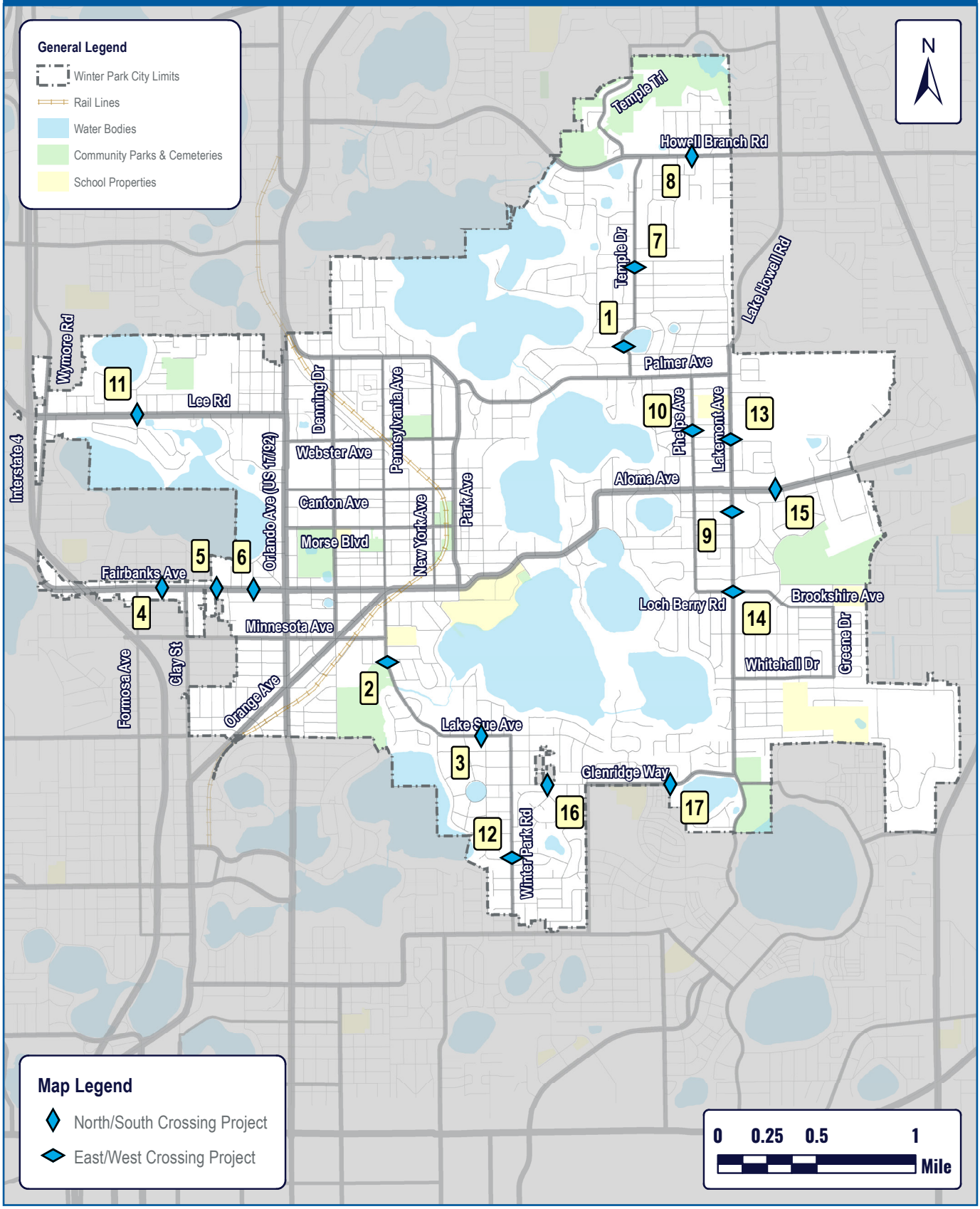
By identifying the barriers between the areas of connected sidewalks, shared use paths, and Greenway Routes, crossing infrastructure can be planned to overcome the obstacles. The highest priority projects in this category provide crossings in locations that tie together greenway routes. Following that, the next highest priority is providing opportunities for people to cross the large arterial streets without going at least a mile out of their way. The crossing projects are shown in Table 5 and Map 22.

A core element of the TMP is the City's desire to follow current and emerging best practices for design. Correspondingly, the crossing projects will require careful and detailed design customized to each location, pursuing progressively more intensive infrastructure as the traffic speed and volume increases on the roadway being crossed. The enhancement of crossings should include Rectangular Rapid Flashing Beacons (RRFBs) at a minimum across neighborhood streets. The projects proposed for crossing multi-lane roadways include both full median refuge islands and overhead mast arms to hold signalization equipment for controlled rather than permissive yielding operations. In all cases, the crossing projects should include needed night-time lighting, sidewalk connections, and site planning such as the relocation of bus stops to be far side of the crossing.

TABLE 5: CROSSING PROJECTS

Priority	Roadway	Location	Improvements	Cost Estimate
1	Temple Drive	Via Salerno (brick pavers)	Curb ramps & RRFB	$163,000
2	Pennsylvania Avenue	Melrose Avenue (brick pavers)	Curb ramps & RRFB	$161,000
3	Lake Sue Avenue	Highland Avenue/Forest Road (brick pavers)	Curb ramps & RRFB	$153,000
4	Fairbanks Avenue	Ohio Street (east leg)	Full median & signal	$1,775,000
5	Fairbanks Avenue	Jackson Avenue	Full median & signal	$1,821,000
6	Fairbanks Avenue	Shoreview Avenue	Full median & signal	$1,775,000
7	Temple Drive	Whitesell Drive (brick pavers)	Curb ramps & RRFB	$140,000
8	Howell Branch Road	Sanbina St/Mandan Trail	Full median & signal	$1,967,000
9	Lakemont Avenue	Goodrich Avenue	Curb ramps & RRFB	$155,000
10	Phelps Avenue	Lakehurst Avenue (brick pavers)	Curb ramps & RRFB	$145,000
11	Lee Road	Turner Road	Full median & signal	$1,904,000
12	Winter Park Road	Spring Lane/Wright Avenue	Curb ramps & RRFB	$153,000
13	Lakemont Avenue	Oakhurst Avenue	Full median & signal	$1,717,000
14	Lakemont Avenue	Loch Berry Road	Curb ramps & RRFB	$171,000
15	Aloma Avenue	Strathy Lane (west leg)	Full median & signal	$1,887,000
16	Glenridge Way	Stonehurst Road/ Brandywine Drive	Curb ramps & RRFB	$160,000
17	Glenridge Way	St. George Street	Curb ramps & RRFB	$168,000
				$14,415,000

Map 22 - Crossing Projects



ROADWAY RECONFIGURATION & STREETSCAPE PROJECTS

The broad category of roadway reconfiguration incorporates diverse projects such as streetscape enhancements, Complete Streets reconfigurations, and motor vehicle operational improvements. The highest priority projects in this category are in the areas of highest pedestrian demand and are intended to improve multi-modal connectivity between neighborhoods and destinations. The roadway reconfiguration and streetscape projects are shown in Table 6 and Map 23.

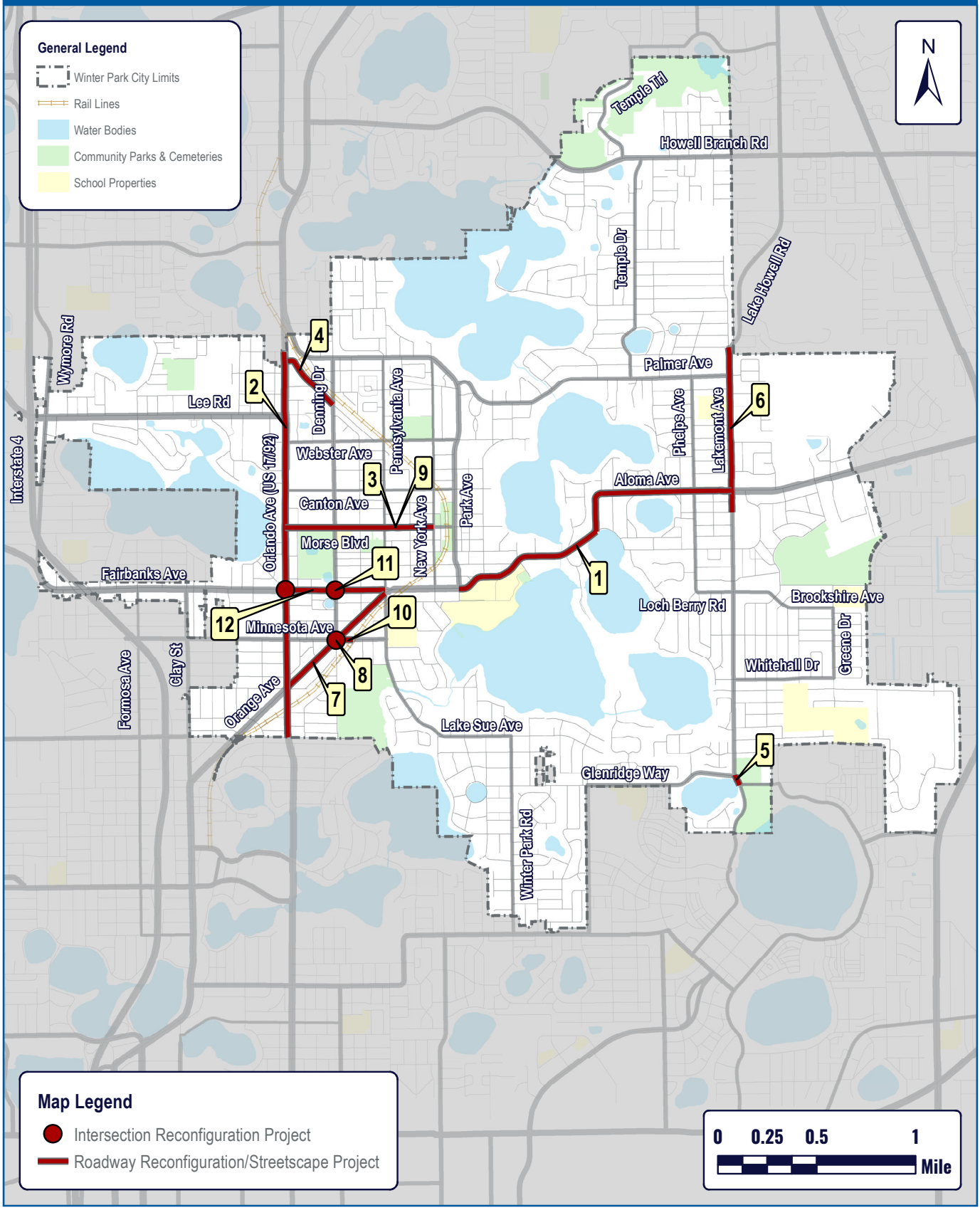
Several roadway reconfiguration projects are currently underway and have progressed through several stages of planning, design, and funding.

- **SR 426 Coalition study and improvements by FDOT** – Evaluating Aloma Avenue between Park Avenue and Lakemont Avenue to identify improvements that would moderate vehicle speeds, improve the safety and comfort of accessing side streets, provide buffers to the sidewalks along Aloma Avenue, and add pedestrian crossing locations. This study effort and community engagement process has proceeded in parallel with the development of this TMP. The project is shown as the City's top reconfiguration and streetscape priority with the cost attributed to FDOT.
- **US 17/92 reconfiguration and improvements by FDOT** – Streetscape enhancements and new traffic signals through Winter Park. Addition of a second eastbound left turn lane from Fairbanks Avenue. The project is shown as the City's second highest reconfiguration and streetscape priority with the cost attributed to FDOT.
- **Orange Avenue** – The corridor between US 17/92 and Pennsylvania Avenue has been studied for Complete treets reconfigurations, to include lane re-allocation for a center left turn lane along with enhanced parking and pedestrian crossings. A focus of those studies has been a roundabout at the intersection with Denning Drive and Minnesota Avenue.

TABLE 6: ROADWAY RECONFIGURATION & STREETSCAPE PROJECTS

Priority	Roadway	Location	Improvements	Cost Estimate
1	Aloma Avenue	Park Avenue to Lakemont Avenue	Reconfiguration, pedestrian safety	Underway by FDOT
2	US 17/92	City Limits	Reconfiguration, streetscape, signals	Underway by FDOT
3	Morse Boulevard Study	US 17/92 to New York Avenue	Complete Streets study	$300,000
4	Solana Avenue	US 17/92 to Denning Drive	Bike lanes	$4,102,000
5	Lakemont Avenue	Glenridge Way to Glenridge Way	Roadway reconfiguration	$12,942,000
6	Lakemont Avenue	Goodrich Avenue to City Limits	Complete Streets reconfiguration	$6,082,000
7	Orange Avenue	US 17/92 to Pennsylvania	Complete Streets reconfiguration	$6,200,000
8	Orange Avenue	Denning/Minnesota	Roundabout	$7,400,000
9	Morse Boulevard	US 17/92 to New York Avenue	Complete Streets reconfiguration	$12,000,000
10	Minnesota Avenue	Denning Drive to RR tracks	Bike lanes	$785,000
11	Fairbanks Avenue	At Denning Drive	Add east and west turn lanes	$1,169,000
12	Fairbanks Avenue	US 17/92 to Pennsylvania Avenue	Complete Streets reconfiguration	$18,500,000
				$69,480,000

Map 23 – Roadway Reconfiguration & Streetscape Projects



TECHNOLOGY PROJECTS

Technology enhancements offer another approach to enhancing network connectivity and can be implemented as an alternative to constructing new network facilities or as a complementary solution alongside other measures. Technology projects explored as part of this plan are not tied to specific locations. Rather, the recommendations are intended to enhance the system with guidance regarding design and implementation provided in a later section of this report. The highest priority projects within this category include creating a Traffic/Event Management Center (TMC) to be supported by a detailed traffic management plan that will establish the protocols and detailed investments needed to maximize the existing technology infrastructure. The next priorities are to implement technology upgrades to improve pedestrian safety and to pursue pilot projects that will gather and apply information to enhance parking operations in Winter Park.

This chapter includes detailed descriptions of the priority Technology Projects below in Table 7. Further guidance for the implementation and design of technology investments in general is included in the following Implementation chapter.

TABLE 7: TECHNOLOGY PROJECTS

Priority	Project	Details	Cost Estimate
1	Traffic Management Center	Underway in partnership with Smart Cities and additional City Departments.	Cost TBD
2	Traffic Management Plan	Identify TMC & VMS locations, CAV readiness, fiber priority needs, emergency preemption, cybersecurity, and timing coordination plans	$150,000
3	Signal Upgrades for Pedestrians	Hardware upgrades & timing plans for 6 locations - APS, LPI, phasing, etc.	$300,000
4	Real-Time Parking Availability System: Garages	Pilot project to install equipment, operate, and evaluate system for a 1-year period	$100,000
5	Gateway Variable Message Signs	4 locations	$400,000
6	Real-Time Parking Availability System: On Street	Fee-based service	$15,000
7	Universal Valet Program	1-year pilot project	$60,000
8	Speed Feedback Signs	4 locations	$100,000
9	Downtown Parking Improvements	TBD	$18,500,000
			$19,625,000

Traffic Management Center

The City is actively developing a Traffic/Event Management Center (TMC.) The enterprise TMC is being established collaboratively across multiple Departments and in coordination with the broader Smart Cities initiative. The TMC and associated communication infrastructure would allow staff to not only observe traffic conditions, but also provide a mechanism for real time monitoring and managing other critical City systems, such as police, fire, water, wastewater, electric, and stormwater/lakes.

Traffic Management Plan

Managing traffic within Winter Park is a complex task that, to be done well, requires coordination of a variety of tasks. First, it is important to understand the end goals for the network so that the right equipment can be selected to achieve those goals. Next, communication plans must be established to identify where equipment should be located in the field. Finally, it is important to identify policies and procedures that will help City staff manage traffic operations efficiently and effectively. Developing a Traffic Management Plan will allow the City to evaluate the existing system, establish goals for how to manage traffic, establish protocols for the planned TMC, and identify a pathway to achieve desired outcomes. Components that should be incorporated within the plan are outlined below.

Communication plays an important role in managing congestion and traffic flow within Winter Park. By establishing a plan for managing traffic during peak hours and events, strategic approaches can maximize the space allocated to moving traffic without expensive and disruptive roadway widening projects. Fiber optic cables are a reliable means to allow communication between traffic control devices. Benefits include bigger bandwidth and higher speeds versus other methods of interconnect. Fiber optic communications will play a critical role in connecting field equipment with the proposed TMC, enhancing the City's situational awareness of traffic conditions.

A communications plan for the traffic signals would outline technologies that Winter Park would like to implement and preferences for how the signal interconnections should be constructed. The plan would be developed in close coordination with FDOT District 5 and the surrounding jurisdictions to ensure that their projects and plans are in line with the City's desires for the signal system. A robust traffic communications system allows traffic signals to be synchronized so that signal timing plans can operate more efficiently. These systems also allow signals to send data to TMCs where staff can monitor signal equipment and respond more quickly to malfunctions. TMCs can also be designed to allow staff to respond to traffic events such as crashes or to monitor traffic associated with planned events. Additionally, signal communication systems enhance signal preemption for transit and emergency vehicles. The Traffic Management Plan should consider how the signal communications system will function with a TMC.

As Winter Park looks to implement new smart technologies to manage traffic and allow communication between motor vehicles, signals, and non-motorized users, it is important to ensure that systems are protected from cyber security threats. Systems that run on cloud-based platforms can be more vulnerable to attacks versus other systems such as Access Point Name (APN) cellular modems. The Traffic Management Plan provides the opportunity to integrate information security at all levels of the system.

Throughout the year, Winter Park hosts a variety of community events that draw visitors from the surrounding areas. Effective management of event traffic can enhance visitors' experience. By creating an event traffic management plan, Winter Park can more efficiently manage traffic during events and can ensure that details are not overlooked in the event planning process. The elements that could be addressed in such a plan would include procedures for setting up road closures during events, defining detours for through traffic, and accommodating parking associated with the event. The plan could establish communication protocols and guidelines including details such as who to coordinate with as well as how to notify residents and visitors of the event traffic management plan. An event plan can be helpful when unplanned circumstances arise because preferred detour routes can be identified ahead of time.

Connected and Autonomous Vehicle (CAV) technologies continue to advance and will likely play a larger role in our transportation networks in the future. Though there is still uncertainty regarding when and how CAV technologies will be implemented, the Traffic Management Plan can begin to consider future advancements in technology by evaluating how current City policies and procedures might be impacted.

Signal Upgrades for Pedestrians

Non-motorized users are particularly vulnerable at intersections where pedestrian and bicycle routes must cross vehicular paths. While traffic signals provide an added level of control for busy intersections, there are supplemental technologies that can be implemented to further enhance the safety of both pedestrians and motor vehicles.

Pedestrian Countdown Signals (PCSs) are square-shaped pedestrian signal heads that display a numerical countdown of the seconds remaining alongside the flashing "don't walk" indication. The intent of these devices is to provide additional information to crossing pedestrians.

Accessible Pedestrian Signals (APS) are equipment directed towards pedestrians at traffic signals to provide audible and/or vibrotactile indicators for pedestrian "walk" and "don't walk" intervals. These systems are intended to assist visually or audibly impaired persons in crossing the intersection. Additional features of APS are dynamic buttons that provide both tactile and audible responses to confirm that a button press has been logged (Figure 10). The equipment can also register the button being held down as a request for additional time to cross for someone with a disability, and correspondingly add time to the pedestrian "walk" phase. APS installations at existing traffic signals should be prioritized at intersections with high traffic volumes and more complex crossing conditions, such as complicated signal phasing or complex crossing geometries.

Leading Pedestrian Intervals (LPIs) are a signal timing option that allow pedestrians a set interval (typically from 3 to 7 seconds) of "walk" time before a concurrent green signal is provided to motor vehicles. This measure allows pedestrians to establish a presence within the crosswalk and helps reduce the risk of conflicts between pedestrians and turning vehicles. LPIs are considered a proven safety countermeasure for reducing vehicle-pedestrian crashes at signalized intersections.

Figure 10 - Accessible Pedestrian Signal (APS) push buttons. (https://commons.wikimedia.org/wiki/File:PedestrianSignalPushButton.jpg)

Real-Time Parking Availability System: Garages

There are many options for parking management systems that rely on sensors installed in parking areas to indicate which parking spaces are occupied or available. Some systems require installation of sensors in individual parking spaces while there are other options that use post-mounted sensors that monitor parking lot entry/exit or a portion of a parking lot.

Winter Park could work with parking lot and/or garage owners to identify a location or locations where a pilot project could be used to evaluate the efficacy of a particular parking sensor system. Investing in a pilot project will allow Winter Park to identify both benefits and challenges associated with a particular system with minimal investment in hardware and operation. An added benefit after even just one year of a pilot program is that the service provider would provide analytics to help officials understand how existing parking is being utilized. The data analytics provided as part of the service could be used in making decisions about a long-term parking management system.

Gateway Variable Message Signs

Winter Park should identify key locations where variable message signs can be installed to manage traffic during special events. Signs should be erected to direct traffic to parking locations and/or to direct through traffic to detours around blocked roads. Locations where permanent signs might be considered are at the perimeter of the central business district in advance of junctions where traffic can be directed to routes that avoid road closures.

Signs should be selected that fit with Winter Park's unique character. Once locations have been identified, portable message signs could be used to test the locations, if desired.

Real-Time Parking Availability System: On-Street

Today there are service providers who can manage applications that predict where parking is likely to be available. The app can be run on a mobile-phone and directs drivers to either on-street or off-street locations where they are most likely to find parking near their desired destination (Figure 11). The selected service provider would perform an initial data collection and analysis task and create the app for Winter Park. This type of parking management system would not involve any investments in hardware installation. Rather, the app would use cellular data to predict where parking is available. Winter Park could invest in the use of this service on a trial basis. An added benefit of this service is that the vendors typically provide data analytics to the City as part of the program. These analytics could help Winter Park enhance its understanding of parking demand and how parking is being used within the city and inform decisions about long-term parking solutions.

Figure 11 - Real-Time Parking Availability App (https://www.pxfuel.com/en/free-photo-xdtig)

Universal Valet Program

Universal Valet is a ticketless valet system that allows users to drop their car at a specified valet stand. Instead of issuing a paper ticket, the service provider would give the customer a link to use for retrieving their vehicle. A benefit of this system is that drivers can retrieve their vehicle from any location within the service area. For example, a customer could leave their car at a stand on the south end of Park Avenue. The customer could then enjoy an evening in downtown Winter Park, perhaps dining at a restaurant and shopping along Park Avenue. Eventually ending their evening at the north end of Park Avenue, the customer could simply retrieve their vehicle using the link instead of walking back to the valet stand, and the valet would bring the vehicle to the customer.

A Universal Valet service would help to reduce the number of drivers circling the downtown area looking for parking. Additionally, Winter Park could select strategic locations for valet stands to reduce the amount of traffic driving through Winter Park. This type of system could serve residents and visitors on a typical weekend evening or other peak times when there is a lot of activity in downtown. Additionally, this system could be used during events to reduce the stress of drivers trying to find parking and to control the flow of traffic around the event.

Prior to implementing a Universal Valet service, Winter Park should work with local business owners and merchants to ensure community support for the program and identify any possible conflicts with existing valet contracts currently held by businesses in the downtown area.

Speed Feedback Signs

Speed feedback signs are digital signs that can be added below a speed limit sign. Speed feedback signs are an effective measure that can be installed within school zones and other locations with identified safety issues to alert drivers when they are exceeding the speed limit. A detector senses the speeds of approaching vehicles and can alert the passing driver to their speed as it relates to the posted speed limit. If a vehicle is traveling above a set threshold, typically 10 mph over the speed limit, the sign can flash a “Slow Down” message.

Winter Park would need to identify locations where speed feedback signs should be installed. A pilot project on a major collector could be considered to evaluate the effectiveness of a sign. Speed feedback signs can be considered at locations where there is a desire to emphasize that drivers travel at slower speeds. For example, in areas where there is a higher volume of pedestrian and or bicycle activity, slower speeds can be important for reducing the risk of severe injury or fatality for vulnerable users.

Downtown Parking Improvements

This project is a placeholder for future investment in parking-related infrastructure. The above recommendations include a TMC, real-time availability systems for parking on-street and in garages, and a universal valet system. Each of those investments will collect and use data to efficiently manage the existing transportation and parking infrastructure, yielding results that will be useful for identifying the needed future investments that will utilize this funding source.

IMPLEMENTATION GUIDANCE

Supporting the capital projects and physical infrastructure identified in the previous chapter, Winter Park employs administrative efforts to improve transportation in the city through the implementation of programs and policies that address the TMP goals. This chapter introduces those policies, identifies opportunities for new polices, and provides guidance on the funding strategies and best practice design considerations that will help advance and ensure the effectiveness of the capital investments.

CITY PLANS, PROGRAMS & POLICIES

The following subsections provide an overview snapshot of the ongoing planning efforts, programs, and policies relevant to meeting the City's transportation goals. The City Code and website should be referenced to acquire the current versions of all referenced documents and to confirm the status of adoption.

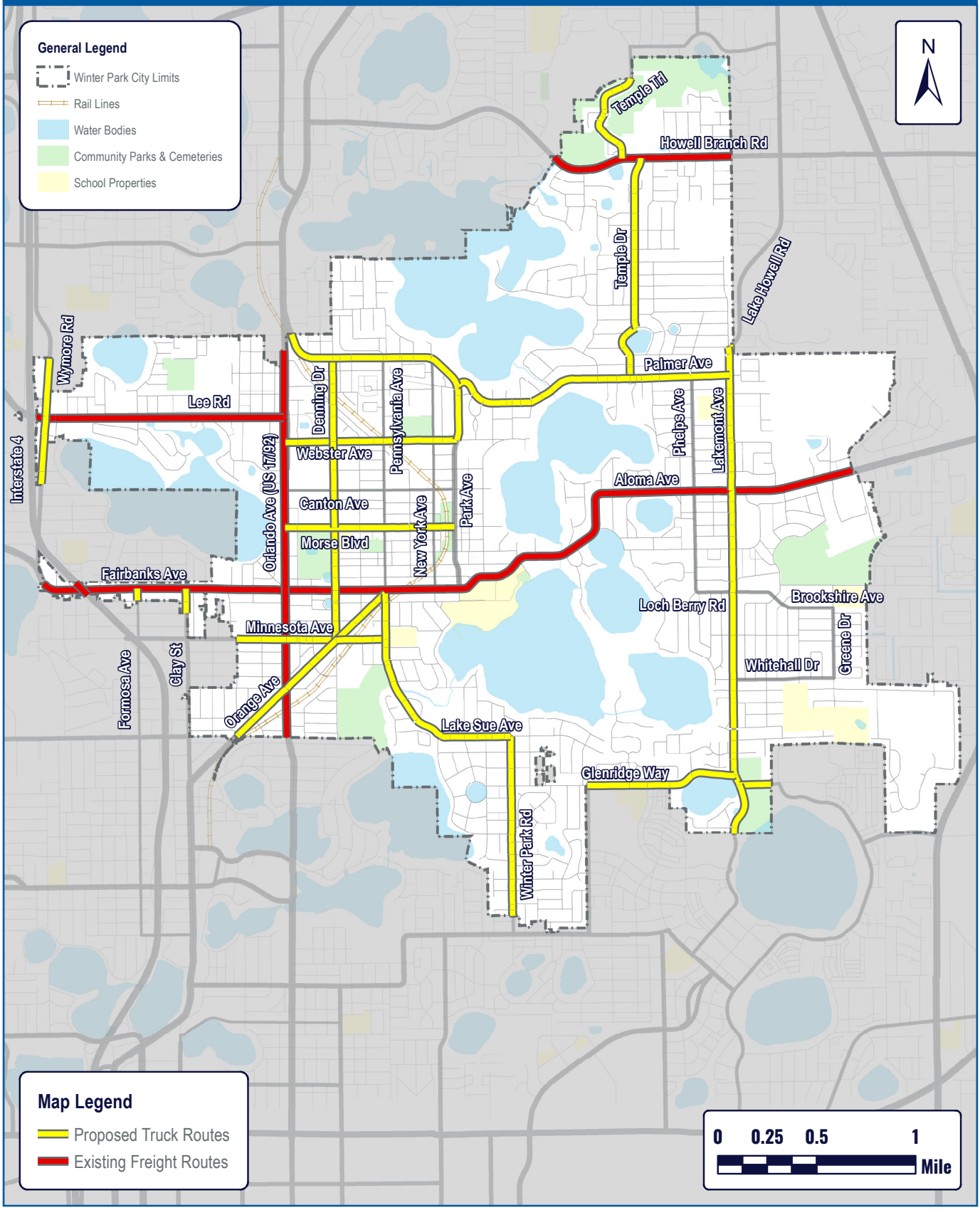
Comprehensive Plan Update

Winter Park is currently in the initial stages of creating an updated Comprehensive Plan that will include a citywide long-term planning effort. The TMP can form the basis of the transportation element of that plan update. Several existing City and regional programs and planning efforts may further support the TMP goals.

Freight Route & Truck Route Updates

The City's designated Freight Routes are regional roadways suitable for through commercial traffic. However, there is a need to identify the routes that delivery and other smaller commercial vehicles should follow until they reach their local street destinations. These secondary commercial routes can be defined as "Truck Routes" with the proposed network shown on Map 23. The proposed Truck Routes for Winter Park consist of a subset of the roadways functionally classified as Collectors and Arterials as shown on Map 4 in the Transportation Network Baseline chapter.

Map 24 – Freight Route & Truck Route Updates



ADA Transition Plan

The City of Winter Park Americans with Disabilities Act (ADA) Transition Plan for the Public Rights-of-Way (ROW) documents the City's goals and objectives in order to ensure that existing and future pedestrian facilities within the ROW are accessible for all people including those with disabilities. The ideal conclusion to this process is the elimination of barriers and the acceptance of requirements of ADA as an everyday reality in all future work. Working in tandem with the TMP, and following the provisions of the ADA Transition Plan, the City shall continue to procure all necessary design and construction contracts required for sidewalk improvements to satisfy all ADA sections and provisions as they pertain to public rights-of-way.

Speed Management & Traffic Calming Policy

The purpose of the Speed Management & Traffic Calming Policy is to improve safety for pedestrians, bicyclists, and motorists by utilizing speed management measures to reduce vehicle speeds and unsafe motorist behaviors in a neighborhood. This policy provides procedures on how residents are able to request a neighborhood traffic study from the City and outlines the parameters of the study, analysis process, and the steps of implementation as a City funded project.

The roadway characteristics that make an ideal bicycling route are fundamentally the same as traffic calming where motor vehicle speeds and volumes are moderated. The Greenway Route Projects identified in the TMP present a strategic opportunity to deploy traffic calming proactively as a part of those projects.

Sidewalk Policy

Many areas of Winter Park were developed in the past without sidewalks on one or both sides of the street. From time to time, city residents have requested the construction of new sidewalks along the local roads. The intent of the Sidewalk Policy is to clearly delineate who bears the cost for such construction, as well as establish the official process and procedures for sidewalk requests from residents.

Street Brick Policy

The purpose of the Street Brick Policy is to provide a means by which residents that currently live on an asphalt or asphalt covered brick street can obtain a brick street without unduly burdening the city's limited street repair funds. The intent of the policy is to define who bears the cost for the brick street surface upgrade.

PARTNER AGENCY PLANS, PROGRAMS & POLICIES

MetroPlan Orlando

MetroPlan Orlando leads regional planning efforts to create a balanced transportation system in Central Florida, which they accomplish through a series of formalized planning processes and documents. The City will work with MetroPlan Orlando to incorporate TMP projects into the corresponding regional plans and funding lists. The key regional planning documents and efforts are summarized below. The current versions of these routinely-updated documents can be found on the MetroPlan Orlando website at: https://metroplanorlando.org/.

The Metropolitan Transportation Plan (MTP) establishes the vision of Central Florida's entire transportation system for Orange, Osceola and Seminole Counties. The MTP identifies current and future transportation needs for a 25-year horizon. After coordinating with local government and transportation agency partners, the cost feasible plan includes a list of projects the region can afford. Projects must be included in the plan to receive federal and state funding. The plan is updated every five years to reflect the changing dynamics of the region.

Once long-term needs are determined by the long range plan, projects are identified on the Prioritized Project List (PPL), a project funding waiting list. Updated annually, the PPL contains a list of unfunded highway, transit, bicycle, and pedestrian projects that have been ranked for funding.

When funding becomes available, the project/project phase moves from the PPL waiting list into the five-year funding program, the Transportation Improvement Program (TIP). The TIP is updated annually and sets the schedule for improvements to the region's transportation system over the next five years. The TIP assigns available funding to specific projects and covers all modes of transportation.

In addition to to coordinating the processes to identify, prioritize, and allocate funding to projects as described above, MetroPlan Orlando leads topical planning efforts focused on issues such as safety. Vision Zero is a worldwide planning initiative that establishes the target of completely eliminating traffic crash fatalities. MetroPlan Orlando was awarded a 2022 Safe Streets and Roads for All (SS4A) federal grant to develop Vision Zero Safety Action Plans for each jurisdiction across the MPO planning area. Building upon the TMP metrics and work program, Winter Park will collaborate with MetroPlan Orlando to conduct community engagement and follow a data-driven process to identify low-cost, high-impact solutions with a goal of fully eliminating traffic fatalities.

LYNX

The LYNX Transit Development Plan (TDP) FY2023-2032 Major Update was adopted in September 2022. The plan calls for a hierarchy of services that include enhancements to the existing local bus and on-demand services, with the addition of commuter and regional express services, limited-stop routes, and community circulators. Over the next 20 years, the vision is to double the amount of bus-based transit service available to the Central Florida region. Within Winter Park, the TDP shows US 17/92 as a Primary Corridor. This includes LYNX Route 102, which is the highest ridership bus route that passes through Winter Park, including a stop at the Winter Park SunRail station. A future bus transfer center in the vicinity of Lee Road and Webster Avenue is shown as an unfunded need.

FUNDING SOURCES AND STRATEGIES

The TMP outlines the strategy for Winter Park to achieve a balanced, safe, and efficient transportation system. The preceding projects and policies are direct actions that move the City towards those goals, but resources are needed to advance that work program. Goal 4 of the Comprehensive Plan recognizes that practical need, stating that "The City will pursue innovative funding strategies to implement a balanced and safe transportation system." This section introduces the currently available funding sources and identifies several funding strategies to be pursued.

The City's current funding for transportation reflects the need for ongoing operations and maintenance. Recurring programmatic spending for these needs is shown in the annual budget. Below are the

recurring annual budget appropriations as of FY 2027. Note that the Public Works & Transportation Department recurring budget appropriations are anticipated to increase in future budgets.

- "Pavement Resurfacing, Brick Repairs" - $1,178,861 (Local option gas tax)
- "Sidewalk, Bike path & Curb Repairs" - $600,000 (Local option gas tax)
- "Bicycle & Pedestrian Improvements" - $100,000 (General Fund)
- "Signalization Upgrades, Pedestrian Signals" - $100,000 (General Fund)

Transportation projects are often large investments and require additional funds beyond the annual maintenance appropriations. Additional funds are available and programmed by the City for discrete transportation projects including Multimodal Impact Fees collected through the land development process and Tax Increment Financing (TIF) funds collected through the Community Redevelopment Agency (CRA). For example, though the CRA funds are used for needs beyond transportation, funding in the amount of $7,140,000 is available through the CRA in FY 2027.

The TMP identifies a suite of new transportation projects that are cumulatively expected to cost $141,608,000 over the planning horizon of 20 years. To implement the full work program would correspondingly require an annual investment of $7,080,400. The above funding sources such as Multimodal Impact Fees and CRA funds may be used for any required local match to leverage the outside funding sources described below.

The first requirement for many transportation funding sources is for the project seeking funds to be shown and prioritized in the appropriate agency planning documents, which is achieved through this TMP. The next step for funding eligibility is that projects should be coordinated with FDOT and MetroPlan Orlando, the designated Metropolitan Planning Organization (MPO) for the region. Utilizing the information provided in the TMP Transportaion Network Baseline chapter, roadway management and ownership will determine which agencies must be involved in the planning and funding processes for each project. By coordinating with MetroPlan Orlando and adding TMP projects into the regional plans and priority lists detailed in the previous section, Winter Park may tap into external funding sources such as State and Federal grants/loans.

Regarding which specific funding sources to target, the largest buckets of federal funding are apportioned to States based on formulas specified by law and then distributed to local agencies and projects through the MPO process. The available federal funding categories and grant programs are routinely updated to reflect evolving trends and priorities. The best approach to pursue federal funding for TMP projects is to have them added to the MPO plans so they will be in line for whatever programmatic federal funds are available when they reach the top of the priority list.

There are a handful of competitive federal grant programs that bypass or run in parallel with the typical MPO process and programmatic federal funding sources. Some of the programs deliver funds directly to local agencies on a faster time line. It is noteworthy that the competitive grant programs evolve and change more quickly than those allocated through the routine MPO process. The current competitive funding programs reflect a national emphasis on equitable non-motorized safety, which is fully in line with the goals and work program of the TMP. One example is Safe Streets and Roads for All (SS4A) that funds safety action plans and projects. Notably, SS4A is the source of funds

MetroPlan Orlando is using for the forthcoming Vision Zero Safety Action Plans. Another competitive grant program that the City should consider is the next iteration of the program oriented towards economic development, currently known as the Better Utilizing Investments to Leverage Development (BUILD) Transportation Grants Program.

DESIGN GUIDANCE

Several existing sets of minimum criteria and design guidance underlie the design of public streets in Winter Park. At the national level, the Manual of Uniform Traffic Control Devices (MUTCD) sets the minimum criteria, and the various publications of the American Association of State and Highway Transportation Officials (AASHTO) provide the most generally-accepted design guidance. Together, these materials form the basis of the design standards produced by FDOT for use in the State of Florida. FDOT then produces the Florida Design Manual (FDM) for use on State highways and the Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (also referred to as the "Florida Greenbook") for all other public streets.

The goals of Winter Park's Comprehensive Plan guide judgments when design decisions require tradeoffs between design elements. The Florida Greenbook provides the following guidance, which emphasizes that context should drive the selection of appropriate design elements and values for each street:

"Users of this Manual are cautioned that the strict application of exact numerical values, conditions or use information taken from portions of the text may not be appropriate for all circumstances. Individual references to design values or concepts should not be used out of context or without supporting engineering judgement."

Cities around the world provide examples of many street configurations that successfully go beyond bare minimums to safely accommodate multiple user groups as fits the community's context and needs. A number of additional resources are available that provide supplementary guidance to the minimum criteria introduced above. FHWA has produced several documents that give examples and guidance for engineers including: "Achieving Multimodal Networks," the "Separated Bike Lane Planning and Design Guide," and the "Bikeway Selection Guide." The National Association of City Transportation Officials (NACTO) have produced further guidance including the "Urban Street Design Guide," the "Urban Bikeway Design Guide," and the "Transit Street Design Guide." It is a professional responsibility of street designers to utilize the full range of available guidance when selecting the appropriate design elements and criteria to be used for each street.

Pedestrians & Bicyclists

Since pedestrian facilities enable other transportation modes to be successful, Winter Park must first prioritize and provide pedestrian accommodations on all streets. This includes crossings, streetscape improvements, and access management to preserve the pedestrian realm within the streetscape. A core principle of this plan is that context should drive the appropriate design elements, and that the goal is to create comfortable and safe routes for people outside cars. In some contexts, comfort requires physically separated bikeways and in other contexts, only wayfinding and simple markings are appropriate. In all contexts, the needs of an aging population will be considered in the planning and design of any project impacting the City's streets and transportation network.

The proposed Public Right of Way Accessibility Guidelines (PROWAG) are currently being finalized and will require Accessible Pedestrian Signals (APS) to be installed at all newly constructed or reconstructed intersections that include visual pedestrian signals. APS should be installed at all new signal installations and at all full signal upgrades. For non-standard locations that present added difficulties for vision impaired persons navigating the crossing, an engineering study should be performed to determine the needs of both the average pedestrian in general as well as pedestrians with vision impairments or other disabilities that affect their ability to navigate the intersection. As a special consideration, at-grade railroad crossings should be evaluated to ensure that safety measures and clearly defined pathways are adequate to serve pedestrians with hearing and vision impairments.

Pedestrian access and safety can be maximized at traffic signals with short cycle lengths and pedestrian phase on automatic recall where feasible. LPIs can also be implemented with actuated pedestrian phases to provide a head start to pedestrians at locations where one of the above circumstances is present but pedestrian volumes are lower. When installing an LPI, APS should also be considered to alert vision impaired pedestrians of the leading WALK time. Otherwise, vision impaired pedestrians will likely start walking when they hear parallel traffic begin to move, which could put them at increased risk for a conflict with a turning vehicle. Automated detection can also be considered for locations where there is a low rate of compliance with using active pedestrian detection systems. Automated pedestrian detection and including the pedestrian walk phase on automatic recall should be considered for locations where there are ADA challenges that make accessing a pedestrian pushbutton difficult or impossible for some users.

An often-overlooked element of supporting and encouraging travel by bicycle is the provision of adequate and quality bicycle parking. Winter Park could update existing requirements for long term bicycle parking within buildings to add guidance and requirements for lockers/showers in offices and other applicable uses, limiting the percentage of required long term spaces that may be hanging, and clarifying that in-unit spaces do not reduce the quantity of long term required in a separate bike room or storage area.

Target Design Speed

There is a consensus that excessive traffic speeds are a concern across all parts of Winter Park. Police enforcement of speeds in all locations, and at all times, is not a reasonable expectation, nor is it an efficient means of addressing the underlying system-wide issue of excessive motor vehicle speeds. A guiding principle of this TMP is that motor vehicle speeds must be moderated in areas where people walking or bicycling is a priority.

Design decisions should use the maximum desired operating speed as controlling design criteria to encourage self-regulation of appropriate motorist speeds and to reflect the desired modal priority of each corridor. This self-regulation of speed will ultimately create a safer space resulting in fewer people injured or killed by traffic crashes.

Brick Streets

The brick streets of Winter Park are one of the most charming elements of the historic and desirable neighborhoods. While charming, brick surfaces can present challenges for people needing mobility support or those using wheeled vehicles. Mature landscaping and trees contribute to the charm, but also limit the physical space available for adding sidewalks. In such cases, an optional design element is to reconfigure and widen the gutter pans of curbs to include a flat area that is wide enough

for someone to walk, push a stroller, or ride a bicycle. The configuration as shown in Figure 12 from Lakeland retains the charm of brick while also providing a space for movement by people outside motor vehicles. This configuration is presented not as a recommended treatment for all brick streets, but as an option to be evaluated where brick streets require reconstruction and sidewalks are not feasible.

Figure 12 - Example of expanded concrete gutter plan for pedestrians and bicyclists in Lakeland, Florida.

Traffic Signals

As Winter Park looks to replace and/or upgrade existing signals or to install new traffic signals, the selection of signal equipment, particularly signal controllers and cabinets, should be made with safety and future technology needs in mind. The following content provides guidance towards the City's desired signal controller equipment. Winter Park currently uses Siemans and Eagle based controllers to operate existing traffic signals; however, Tactics is not used to manage the signals – which means there is no ability to monitor signal controllers and activity remotely. Adjacent communities use Q-Free signal controllers which have better interconnect and communication abilities. As Winter Park makes upgrades to traffic signals, the existing controllers should be phased out and all upgrades and new signals should specify Q-Free controllers. This will provide better options for communicating with signals in neighboring communities and jurisdictional partners. Additionally, this will aid in City efforts to manage traffic signals by allowing for remote monitoring.

As connected and autonomous vehicle technologies advance and as traffic control technologies adapt to manage smarter vehicles and communities, there will likely be a need to house additional hardware in traffic signal cabinets. FDOT District 5 staff indicated that new traffic signals should be designed to specify larger signal cabinets so that space for additional hardware will be readily available in the future.

At this time, Winter Park does not need to begin replacing all cabinets; however, if there are damaged cabinets at existing traffic signals that need to be replaced, or if there are new traffic signals being constructed, larger cabinets should be specified instead of the current style of cabinets. Much of the industry is shifting to Advanced Traffic Controller Cabinets (ATCC).

Connected Vehicles, Autonomous Vehicles, and Adaptive Signals

Connected and Autonomous Vehicle (CAV) technologies are expected to provide considerable safety and mobility improvements in the future; however, these technologies are currently evolving at a rapid pace. Many of the technologies can become outdated within a five-year period. Because of the shortened life span of these technologies, the benefit of investing in new hardware is not always cost-effective.

A variety of CAV technologies are still being researched and undergoing pilot testing. FDOT District 5 currently has projects underway to evaluate connected vehicle technologies that would improve traffic management and enhance roadway safety for all users. As part of the PedSafe project, FDOT is developing a collision avoidance system to prevent pedestrian and bicycle collisions. The SR 434 CV Pilot project located in Seminole County is examining the role of connected vehicle technologies with applications including preemption, Transit Signal Priority, and other traffic signal operations metrics. This project has been a starting point for the PedSafe project. The I-75 FRAME (Florida's Regional Advanced Mobility Elements) project is looking at ways to enhance traffic management in the event of an emergency through real-time communication with motorists. The University of Central Florida (UCF) is leading the FUTURe CITy (Fostering Smart Urban Transformation and Ubiquitous Resilience with Connected Infrastructure and Technology) initiative which focuses on implementing smart technologies in urban environments.

Several vendors are offering pilot deployments of automated transit vehicles. The walkable downtown core of Winter Park is an ideal setting for automated transit services should a vendor pilot or funding program opportunity arise.

At this time, it would be prudent for Winter Park to follow these and other research initiatives and pilot projects that are exploring CAV technologies. As these technologies mature, Winter Park can begin to evaluate which systems would be best suited for meeting the needs of the local community. In preparation for technology shifts, coordinating with FDOT District 5 can ensure that investments in new traffic signal equipment are made with future uses in mind. Additionally, Winter Park should review existing policies that could be impacted by emerging CAV technologies.

Intersection Collision Avoidance Safety Program (iCASP) is a red-light running crash prevention system that predicts when a vehicle might run a red light and then holds the perpendicular red phase to reduce the risk of a collision. The system can be implemented in tandem with red light running cameras to document near miss collisions. iCASP should be considered at intersections where there is a history of red-light running crashes or where there is a higher risk of red-light running crashes. Locations can be identified through a review of crash data for signalized intersections.

Automated pedestrian detection systems are a form of passive pedestrian detection that will automatically place a call for a pedestrian signal when a pedestrian is present within a specified area at the roadway crossing. These systems do not require any action on the part of the pedestrian and

can, therefore, especially benefit people who have difficulty accessing a pedestrian push button. These devices can also be used to track pedestrian progress in the crosswalk and adjust the WALK phase to provide additional time for individuals who cross at a slower-than-average pace.

Electric Vehicle Charging

The share of Electric Vehicles (EVs) on the road continues to grow, and with it the demand for EV charging stations is growing. The City Code should be referenced for the current requirements to accommodate EVs in private land development or redevelopment. Charging technologies are still in a state of rapid evolution, with new ideas being researched. As well, there are different types of chargers made to serve different vehicle models.

Because charging stations typically require a longer period of time to charge the vehicle battery versus the time needed to fill a standard fuel tank, many communities are exploring new opportunities for EV charging that differ from the typical fueling station design. For example, charging stations can be installed in parking locations close to retail stores and restaurants, thereby allowing the driver to engage in other activities while the vehicle charges. With its proximity to I-4 and its unique character, including numerous shopping and restaurant options, Winter Park could be a prime location for both travelers and nearby residents to stop and recharge vehicles.

Because the technologies are still rapidly advancing, Winter Park staff shall carefully evaluate how EV charging can and should be installed. One of the first steps in developing an EV charging policy or program is to coordinate with utility providers to understand the local capacity for providing EV charging. This initial step can help Winter Park identify any needed utility improvements that should be implemented prior to the installation of EV charging stations. Additionally, the utility providers might be able to help identify the preferred locations for installing charging stations based on access to electric utility lines.

One element that should be carefully considered is the location of EV charging stations intended for general public use. For example, if a charging station is installed at a curbside location, the ability to change how that section of curb is used in the future will be limited. Additionally, curbside EV charging stations could impact the turnover rate of on-street parking.

EVALUATING PROGRESS

The baseline network and performance measure metrics are a starting point to determine the success of transportation projects. For those performance measures in which data may not be available, a methodology to begin data gathering will be developed. More complex performance measures will likely require interagency coordination to collect the necessary data and to improve accuracy. Though some of this data is already gathered regularly, other performance measures may require special studies or dedicated staff time for appropriate data collection.

Figure 13 - Reallocation of roadway space for pedestrians and congregating in downtown Winter Park.